TERRORIST THREATS TO ENERGY SECURITY

HEARING

BEFORE THE

SUBCOMMITTEE ON
INTERNATIONAL TERRORISM AND
NONPROLIFERATION

OF THE

COMMITTEE ON
INTERNATIONAL RELATIONS
HOUSE OF REPRESENTATIVES

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

JULY 27, 2005

Serial No. 109–70

Printed for the use of the Committee on International Relations

Available via the World Wide Web: http://www.house.gov/international_relations

U.S. GOVERNMENT PRINTING OFFICE
22–655PDF WASHINGTON : 2005

For sale by the Superintendent of Documents, U.S. Government Printing Office
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TERRORIST THREATS TO ENERGY SECURITY

WEDNESDAY, JULY 27, 2005

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON INTERNATIONAL TERRORISM
AND NONPROLIFERATION,
COMMITTEE ON INTERNATIONAL RELATIONS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 2 o'clock p.m. in room 2200, Rayburn House Office Building, Hon. Edward R. Royce (Chairman of the Subcommittee) presiding.

Mr. ROYCE. This hearing on Terrorist Threats to Energy Security will come to order.

The possibility of energy terrorism—attacks on the world's energy infrastructure—doesn't generate the same attention as potential chemical or biological or nuclear terrorism. But the economic implications of such attacks are potentially enormous. Many believe that the reason we are looking at oil at $60 a barrel is the fact that we have a "terror premium" factored into the price of a barrel of oil. Some suggest that oil terrorism is emerging as a major threat to the global economy. Combating this threat should be a part of our complex goal of improving our Nation's energy security.

Because of U.S. energy demands and the global nature of energy markets, terrorists can strike at us almost anywhere in the world. Oil markets are tight, with little spare capacity, and demand is increasing. As we will hear today, there is strong evidence that a relatively small disruption to oil production throughout the world could spike world energy prices, severely harming the American economy. We have taken steps to improve the security of the energy infrastructure of this country since 9/11. But, unfortunately, terrorist attacks abroad could hurt us as if they were committed here at home.

Al-Qaeda and others seem to be thinking this way. Al-Qaeda documents call for, in their words, "hitting wells and pipelines that will scare foreign companies from working there and stealing Muslim treasures." Last February a message posted on an al-Qaeda-affiliated Web site entitled "Map of Future al-Qaeda Operations" stated that terrorists would make it a priority to attack Middle East oil facilities.

The vulnerability of Saudi Arabia to energy terrorism is a particular concern. By far, Saudi Arabia is the world's most important oil-producing country, being the largest exporter and the only country with significant excess production capacity. Saudi intelligence reportedly disrupted an attack against the Ras Tanura refinery—

the largest in the world in 2002. Over the last few years there have been several deadly attacks on Western oil workers, including Americans. These attacks have disrupted oil markets and drove up insurance premiums. It is worth noting that some Saudis support these terrorist attacks by their financial support for Wahhabism abroad.

Pipelines, which carry one-half the world's oil and most of its natural gas, are generally built above ground, making them common targets for terrorists and insurgents. Pipelines have been attacked in Chechnya, Turkey, Nigeria, Colombia, and elsewhere, costing local governments billions of dollars. In Iraq, pipeline attacks have been pervasive. It is estimated that pipeline sabotage has cost Iraq more than $10 billion in oil revenues, despite the high priority coalition forces have put on pipeline protection. There is concern that the insurgents who have been attacking Iraqi pipelines have gained a measure of expertise, which will be transferred elsewhere.

Global shipping chokepoints are vulnerabilities in the world's energy system. The Strait of Malacca is one of the world's busiest sea lanes, through which half the world's oil supplies and two-thirds of its liquefied natural gas transit to energy-dependent northeast Asia. The narrow and shallow straits have a long history of piracy, and today well-established terrorist groups operate in the region, including Jemaah Islamiya. Some believe several troubling scenarios are possible, including a terrorist hijacking of an oil or LNG tanker, to be turned into a floating bomb to be detonated in a busy seaport.

These issues are just one part of the complex issue of energy security. An important task in setting policy is gauging the likelihood of a potential terrorist threat and assessing the likely impact. Only with that information on the table can priorities be established. It is my hope that today we can answer some of these questions in this regard and begin to look at the adequacy of policies designed to address terrorist threats abroad to our energy security.

With that said, I will now turn to the Ranking Member for any statement Mr. Brad Sherman might have.

Mr. SHERMAN. Thank you, Mr. Chairman. Thank you for holding these hearings.

We should remember that there is one world price for oil, and that American consumers will be forced to pay that price. Even if United States oil companies have secure sources of oil from Africa or Latin America, they will charge us that price. The best insurance to prevent terrorist activities from causing a spike, or an extreme spike in the price of oil, is the Strategic Petroleum Reserve, and this should, again, not be just a U.S. concern. There is one world price; thus if there was an interruption of 10 or 20 percent of the world's oil production and the U.S. were to open its Strategic Petroleum Reserve, that would be in effect feeding a world supply. What is fair is that all energy-consuming nations should have a Strategic Petroleum Reserve, whether within their borders or elsewhere, so that we can act in concert to keep the price of oil at what we have now adjusted to, and that is this extreme $60 a barrel, or hopefully less.

The Chairman points out the Straits of Malacca as a chokepoint; the Straits of Hermuz perhaps even more so. And I hope that our witnesses will describe what pipelines exist or could exist, or whether it would be helpful for them to exist to bring Saudi and Gulf—to get Gulf oil to world markets without necessarily transiting the Gulf.

Saudi Arabia is, of course, the largest producer, well the largest exporter, but also the largest reserves, and yet this is a country that funds jihadists. We have to soft-pedal or feel we have to soft-pedal our criticism of Saudi actions when, as the Chairman points out, they are funding those ideologically committed to terrorism.

India and China and other developing Asian countries are thirsty for oil. This will drive up world prices solely, or, God forbid, quickly, if we have any interruption or even the threat of an interruption. China is, of course, reaching out to some unsavory regimes for oil such as Iran and Sudan. And Hugo Chavez, who may style himself as the new Castro, dreams of the day when he can sell his 1.2 million barrels a day to China instead of the United States.

I look forward to learning what we can do to assure a supply of oil at—I won't say a reasonable price—but a price that does not reflect further shocks; what we can do to make our economy—and this may go outside the jurisdiction of our Committee—immune to the possible oil shocks to come. Obviously, the thing we could do most—and again, this is outside our jurisdiction—is to move toward a time when we are not so oil dependent. The days when 94 percent of our transportation needs are met by oil need to end.

Along those lines, I should use this opportunity to advertise the opportunity for co-sponsorship of a bill that was introduced by Republican John Shadegg of Arizona and myself to provide for cooperative research between the United States and Israel on energy, new energy efficiencies. It is, for those of you taking notes, H.R. 2730, the United States-Israel Energy Cooperation Act. With that, I yield back.

Mr. ROYCE. Thank you, Mr. Sherman.

We have with us Mr. Robbie Diamond. He is President of Securing America's Future Energy (SAFE), which was founded in August 2004. It is committed to reducing America's dependence on oil in order to improve our national security and strengthening the economy.

Prior to joining SAFE, Mr. Diamond worked for Fontheim International, a consulting firm. And Mr. Diamond will show a 3½-minute video to start his testimony.

Before we go to that, John Dowd is the Senior Research Analyst covering the oil services industry. He joined Sanford C. Bernstein & Company in 1993 as a Research Associate covering the integrated oil companies. In 2003, Mr. Dowd was ranked among the best oil services analysts by Greenwich Research Associates.

Mr. Gal Luft is Co-Director of the Institution for the Analysis of Global Security. He specializes in strategy, geopolitics, terrorism, and Middle East and energy security. Mr. Luft has had numerous studies and articles on security and energy issues published in various newspapers and publications, including the *Wall Street Journal.*

Before proceeding, I would like to recognize the Subcommittee Staff Associate, Mr. Greg Galvin. I am going to ask him to stand. This is Greg's last hearing. He is headed off to Georgetown University Law School in the fall. We wish him the best. He has done a great job for the last 3 years for this Committee, and for that we are very appreciative.

How many minutes do we have left? I think not enough time, Mr. Diamond, for your video until after we return. So why don't we recess this for the four votes? So that will be about a 30-minute recess and we will return as soon as they are finished.

[Recess.]

Mr. ROYCE. Greg Galvin, one last task as we get underway here. We want to queue that video up. You got that ready to go? Okay.

[Video played.]

STATEMENT OF MR. ROBBIE DIAMOND, PRESIDENT, SECURING AMERICA'S FUTURE ENERGY (SAFE)

Mr. DIAMOND. Thank you. Good afternoon, Chairman Royce and Members of the Committee, and thank you for holding this hearing to advance our understanding of America's dependence on oil and the serious national security vulnerabilities of this dependence. I appreciate the opportunity to discuss "Oil ShockWave" and the key findings. I speak to you today on behalf of Securing America's Future Energy, or SAFE, a nonpartisan group that is committed to reducing America's dependence on oil in order to improve national security and strengthen the economy.

The purpose of Oil ShockWave was to reveal and dramatize the very real risks of oil dependence. The oil markets are so vast and complex and the threats are so varied that sometimes it is difficult to comprehend the issue. The simulation was designed to make this issue tangible for the public as well as lawmakers and policymakers. From the first day that we started planning the simulation, we believed that being profoundly realistic and having unimpeachable credibility was imperative. Therefore, we recruited a highly respected bipartisan cabinet, as well as worked with a group of experts and credentialers, to develop and verify the authenticity of the scenario. These included former members of the oil industry, oil analysts and traders, former military officials, intelligence and national security experts, and other specialists.

I want to get right to the point and begin reviewing some of the key findings from Oil ShockWave.

First, there is really no such thing as foreign oil. Oil is a fungible global commodity; a change in supply or demand anywhere will affect prices everywhere.

Second, given today's precarious balance between oil supply and demand, taking even a small amount of oil off the market could cause prices to rise dramatically. In Oil ShockWave, a 4 percent global shortfall in daily supply results in a 177 percent increase in the price of oil from $58 to $161 per barrel. We are talking about a shortfall between 3 and 3.5 million barrels in a roughly 84-million-barrel global market.

Third, once oil supply disruptions occur, little can be done in the short term to protect the U.S. economy from its impacts. There are few good short-term solutions.

Fourth, there are a number of supply-and-demand-side policy options available, but benefits from these measures will take a decade or more to mature and thus should be enacted as soon as possible.

Fifth, beyond the terrorist threat to a vast and vulnerable oil infrastructure and system, the danger of political instability or uncertain investment environments in countries that are major oil producers present, in many respects, the greatest risk for the long-term stability of oil markets and the ability to meet world demand.

Sixth, the oil system is vulnerable to attacks on key energy infrastructure both overseas and at home. Because that infrastructure is simply too vast, we must seek other ways to reduce this vulnerability, such as reducing demand and finding alternatives to diversify our fuel sources.

Finally, the Strategic Petroleum Reserve, or the emergency supply of Federally-owned crude oil, offers some protection against a major supply disruption. That protection is limited in both scope and duration. Emergency reserves cannot sustain the United States through a prolonged crisis. In addition, Oil ShockWave revealed that it is extremely difficult to reach consensus on when it is appropriate to draw on the strategic reserve.

In conclusion, with 97 percent of the transportation in the U.S. fueled by oil, oil is the lifeblood of the U.S. economy. Oil ShockWave demonstrated we must move rapidly to protect the Nation from an oil supply crisis that could have dramatic economic and national security implications.

When we were attacked on 9/11, many people were surprised at the terrorist threat and the U.S. vulnerability. Our response to 9/11 must be to make sure that we are not surprised again. We must anticipate and prepare for the next attack by acknowledging the vulnerabilities and addressing them. Few weaknesses demand greater attention than oil security. I am heartened to see this Committee raising and addressing this serious national security concern, and Securing America's Future Energy looks forward to working with the Committee in the coming months. Thank you.

[The prepared statement of Mr. Diamond follows:]

PREPARED STATEMENT OF MR. ROBBIE DIAMOND, PRESIDENT, SECURING AMERICA'S FUTURE ENERGY (SAFE)

Good morning Chairman Royce and Members of the Committee and thank you for holding this hearing to advance our understanding of America's dependence on oil and the serious national security vulnerabilities of this dependence which, if exploited, could result in widespread economic dislocation and increased global instability.

I speak to you today on behalf of Securing America's Future Energy (SAFE), a nonpartisan group that is committed to reducing America's dependence on oil in order to improve our national security and strengthen the economy. SAFE is working to transform oil dependence from a rhetorical turn of phrase and an insider's game to a tangible economic and national security issue that compels political leaders, business executives and the public to act now.

On June 23, 2005, SAFE, in partnership with the National Commission on Energy Policy, conducted a high profile Cabinet Level Oil Crisis Simulation called *Oil ShockWave*, which explored the extent and acuteness of the economic and national security threat and the possible consequences of American oil dependence.

In this half-day exercise, top former government officials took part in a series of Principals meetings of the Cabinet or of a Special Working Group over a seven-month period in order to advise the President on how to respond to a series of events that affect world oil supplies. The scenarios were designed to simulate a de-

cline in world oil production due to regional instability and to terrorism. The simulation events began in December 2005 to provide some distance from current events.

Situations were presented primarily through pre-produced newscasts shown on video screens as well as "injects" or notes given to Cabinet members throughout the simulation. The participants were informed of their roles ahead of time, but they were not informed about the events and situations they would encounter. We wanted them to respond in real time to each new situation. However, Dr. Robert Gates, President of Texas A&M and former Director of Central Intelligence, who played the role of National Security Advisor in the simulation, was considered in simulation parlance "a trusted agent" so he was made aware of the scenarios before the event.

Simulation Participants

The *Oil ShockWave* Cabinet was comprised of the following bi-partisan group of former Cabinet members and senior government and national security officials:

- *Robert M. Gates*, former Director of Central Intelligence and current President of Texas A&M;
- *Carol Browner*, former Administrator of the Environmental Protection Agency;
- *Richard N. Haass*, former Director of Policy Planning at the Department of State and current President of the Council on Foreign Relations;
- *General P.X. Kelley*, USMC (Ret.), former Commandant of the Marine Corps and member of the Joint Chiefs of Staff;
- *Frank Kramer*, former Assistant Secretary of Defense for International Security Affairs;
- *Don Nickles*, former US Senator (R–OK);
- *Gene B. Sperling*, former National Economic Advisor and head of the National Economic Council;
- *Linda Stuntz*, former Deputy Secretary of Energy;
- *R. James Woolsey*, former Director of Central Intelligence.

I certainly want to take a moment on the record to thank them all again for participating and for committing a significant amount of time. It is due to the participation of such prominent, serious, and well-respected people that we are able to bring even more awareness to this critical economic and national security issue.

I want to spend my time discussing three things: (1) Why we developed *Oil ShockWave*? (2) How we developed *Oil ShockWave*? and (3) What we learned from *Oil ShockWave*?

I) Why We Developed "Oil ShockWave"?

We believed that developing and conducting a simulation would be an engaging format to generate attention for this issue, but more importantly to foster an understanding of our energy insecurity. The simulation was designed to make this issue real and tangible for the public as well as lawmakers and policymakers.

The oil markets are so vast and complex and the threats are so varied that sometimes it is difficult to comprehend the issue of oil use, oil dependence, and oil security threats and risks. We received great feedback for the SAFE brochure that simply laid out the key facts with very little editorial comment. The facts themselves are incredibly compelling and persuasive. For instance (quoting directly):

- "97% of transportation in the United States is fueled by oil"
- "The transportation sector alone consumes 68% of all US oil"
- "Total US oil consumption is forecasted to increase by 40% from 2003 to 2025"
- "125% increase in the demand for oil in India and China 2003 to 2025"
- "$7.4 billion increase in the US oil bill per year for each one-dollar increase in the price of oil."

The simulation, in a different and more serious format, similarly gets to the key facts in a compelling fashion.

Furthermore, it was important for us to get beyond some of the general statements of oil dependence and look into the specific issues, threats, consequences, and responses. There is nothing like watching, listening, and learning as a group of former Cabinet members and senior government officials sit in a "mock" situation room responding in real time to a series of plausible and credible events. This is

hopefully something that all champions of this issue can use to build support for serious action.

Finally, based on recent discussions about how market speculators and traders have changed the oil futures market and are currently driving the price of oil, we wanted to do some modeling that brought this new dynamic into the equation when considering possible scenarios and the impact on oil prices. Thus, we were hopefully able to contribute some new intellectual analysis and content to the public discussion on oil markets and national and economic security.

II) How We Developed "Oil ShockWave"?

From the first day we started planning the simulation, we believed that being profoundly realistic and having unimpeachable credibility was imperative. Therefore, we recruited and worked with a group of experts and "credentialers" in the fields of national security, world oil production and distribution, trading, and macroeconomics to develop and verify the authenticity and plausibility of all aspects of the scenario from the oil market disturbances to the impact on oil prices and the economy. These included former members of the oil industry, oil analysts and traders, former and current military officials, intelligence and national security experts, and other specialists.

For instance, we worked closely with: David Frowd, former Head of Strategy and Planning in Shell's Upstream Headquarters in the Hague and former Head of the Energy Team in Shell's Global Business Environment Department; Neil McMahon, a prominent Oil Analyst at Sanford Bernstein; Rand Beers, former Special Assistant to the President and Senior Director for Combating Terrorism; Ged Davis, former Head of Royal Dutch/Shell Group Scenarios Team; and Colonel Randall J. Larsen, Founding Director of The Institute for Homeland Security and Simulation Game Specialist.

The fundamental question we needed to address was the means to take oil off the market. There were literally hundreds of scenarios to take oil off the market to different degrees and for different periods of time. It was our determination to put together a set of circumstances and events that were dramatic, but were neither shocking nor unexpected. We worked diligently to stay away from the sensational. As Robert Gates told the *Washington Post* after *Oil ShockWave*, "the scenarios portrayed were absolutely not alarmist; they're realistic." Jim Woolsey, another former Director of Central Intelligence, who played the Secretary of Homeland Security called the attacks during a post-simulation interview "relatively mild compared to what is possible."

Beyond the terrorist threat to a vast and vulnerable oil infrastructure and system, it was the danger of political instability in countries/regimes that are major oil producers that presented the greatest risk to the US and our oil dependence. Freedom House considers only 9% of world oil reserves to be in countries that are considered "free" and Transparency International has shown that oil riches are highly correlated to their corruption rating. In many respects, it is the political instability and possible violence that force international oil expertise to leave the country and scares away foreign investment that is a more serious threat to the long-term stability of oil markets and the ability to meet world demand. For instance, some of the slowdown in Russian production that is an important element of world oil supply and demand forecasts is simply attributable to a tougher regulatory and less secure investment environments based on recent actions by the Russian government against Yukos and other oil interests.

The Scenario

In the end, we settled on three segments. Segment 1 takes place roughly 5-months from today on December 14, 2005 with political violence and unrest in Nigeria, the fifth largest supplier of oil to the US, forcing foreign companies to "shut-in" or close 600,000 barrels of oil per day in the Niger Delta for the foreseeable future. The situation is exacerbated by a very cold winter in the northern Hemisphere that increases demand by 700,000 barrels of oil per day. Based on the current projections of demand and supply at the time, these events result in a gap of more than 2 million barrels per day between supply and demand. We predicted this shortfall would drive a barrel of oil from $58 at the start of the simulation to $82 per barrel at the end of Segment 1. The price of gasoline rose from $2.21 to $3.31 respectively.

This Segment turned out to be more realistic and plausible than we could have expected. Several days before we conducted *Oil ShockWave*, crude oil prices broke $60 on news of possible unrest and al Qaeda activity in Nigeria. It was odd to have reality catching up to the simulation we had started developing several months before. We had initially been debating if a starting price for oil at $58 was too high. In fact, we were a bit low!

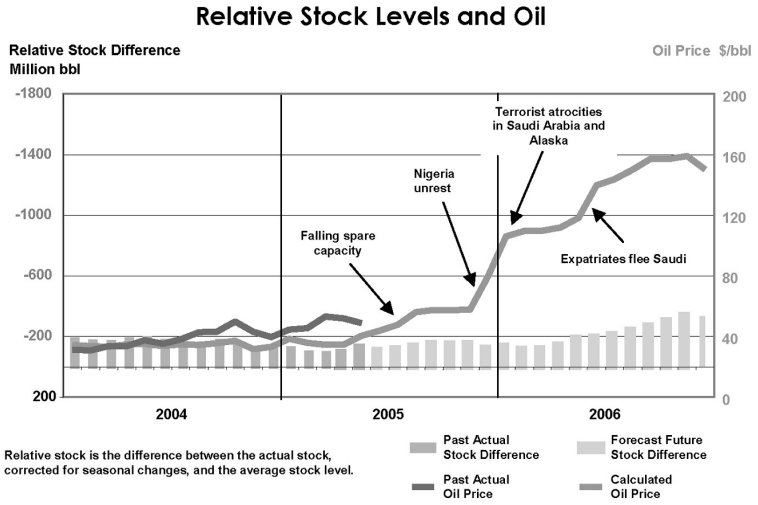
Segment 2, involving coordinated terrorist attacks in the US and Saudi Arabia, takes place on January 16, 2006. The first attack is on the Haradh natural gas processing plant in Saudi Arabia, about 280 km southeast of Dharan, taking 250,000 barrels of oil off the market that now needs to be diverted for domestic use. There is also a failed attempt to ram a hijacked super tanker into another tanker at a loading jetty at Ras Tanura, the world's largest oil port. Finally, about 20 minutes into the Segment, the Secretary of Homeland Security informs the Cabinet that a super tanker has rammed into another tanker at the port of Valdez in Alaska and there has been a ground attack on the holding tanks that are now on fire. The attack on the port of Valdez takes another 1 million barrels of oil off the market per day. This means that the world oil shortfall is about 3.4 million barrels per day. We predicted this shortfall would drive a barrel of oil to $123 and the cost of gasoline to $4.74 per gallon. This type of coordinated attack bears the classic signature of al Qaeda.

Segment 3 takes place on June 23, 2006, six-months after the initial event that begins the simulation. A new campaign of terror against foreign nationals in Saudi Arabia has forced them to be evacuated. In the prior 48 hours, 120 Americans have been killed and another 100 wounded; altogether more than 200 foreign nationals have been killed and 250 have been wounded. It is the highly aggressive crackdown on dissidents and al Qaeda sympathizers after the attacks in January on the Haradh natural gas processing plant and Ras Tanura that appears to be resulting in this popular backlash and terror campaign. The loss of international oil expertise means that Saudi Arabia will not be able to meet future demand growth and to build, hold, and use spare capacity. This scenario drove the price of oil to $161 per barrel and the price of gas to $5.74 per gallon. It is critical to note that no additional oil was taken off the market. The mere inability to have Saudi Arabia as the producer of last resort is enough to create unimaginable consequences.

The Impact of Events on the Price of Oil

I do not want to spend too much time explaining how we arrived at the prices for oil as we have a witness from Sanford C. Bernstein, who will hopefully speak about the issue and who helped develop one of the "pricing models" for the simulation. However, I will quickly review some of the people we consulted and their approaches to pricing.

First, a price-forecasting model we consulted, independent of Bernstein, was looking at stock levels and risk premiums (see submitted attachment). In general, high oil stocks, held by government and industry, lead to low prices, and low stocks lead to high prices. However, during 2004 and the early part of 2005, oil prices have been much higher than the supply/demand balance and the resultant stock levels would suggest. Many experts attribute this to added risk premiums in an unpredictable world with little spare capacity. Based on events in *Oil ShockWave*, we believed the market perceptions of risk premiums determining the price of oil would become even more pronounced. David Frowd, a former oil industry executive, offered the following graph to track prices during the scenario:



Second, we consulted with Neil McMahon PhD and his team at Sanford C. Bernstein to review the scenario and offer an analysis regarding the impact of scenario events on the price of oil. Bernstein is a unit of Alliance Capital Management that manages some $64 billion (as of December 31, 2004) for a private clientele and is well known for investment research. They used the Bernstein Oil Price Calculator to calculate initial prices and prices for Segment 1. The key inputs of the Bernstein Oil Price Calculator are oil demand, spare OPEC capacity, and non-OPEC supply projections. This method did not work for Segments 2 and 3 of *Oil ShockWave*. By Segments 2 and 3, there was no longer any OPEC spare capacity in the global oil system based on prior simulation events, and thus the metrics fell outside the boundaries of the Calculator. Dr. McMahon and Bernstein oil analysts used historical analogues to calculate prices for Segments 2 and 3. Sanford C. Bernstein has since issued an in-depth 27-page report based on *Oil ShockWave.*

It should be noted that we consulted with additional analysts and experts who offered opinions based on private trading models. These were in line with our price projections throughout the simulation.

Economic Effect of Projected Oil Spike to $120

The final economic analysis we conducted regarded the economic effects of oil at $120 per barrel. This is roughly the price of a barrel of oil at the end of Segment 2. Ronald E. Minsk, former Special Assistant to the President for Economic Policy at the National Economic Council, was the principal author. Some of the key findings were as follows:

- a recession following two quarters of declining GDP and a decline in 2006 GDP compared to 2005 GDP;
- approximately 800,000 jobs were expected to be lost during 2006, and over 2 million were expected to be lost in 2007, relative to baseline forecasts;
- a $2,680 increase in annual gasoline costs to the average US household, driving average annual household gasoline costs to a total of $5,214;
- an historically significant decline in the S&P 500;
- a dramatic increase of the current accounts deficit—to $1.087 trillion in 2006 and to $1.052 trillion in 2007—as a result of the increased cost to purchase "foreign" oil.

Ronald Minsk notes several factors that cause the fall in GDP and the ensuing recession:

- consumers spending more on gasoline and thus cutting other spending;
- certain energy intense capital is idled or its utilization rate falls;
- automobile purchases decline sharply due to the uncertainty of oil prices;

- air travel falls as airfares rise due to higher fuel prices;
- lower consumer spending due to lower consumer confidence.

The potential economic effects of oil prices in Segment 3 were not estimated because crude oil at $161 is so far outside the range of experience that there were no models on which to base estimates.

III) What We Learned From "Oil ShockWave"?

It is useful to review some of the key findings from *Oil ShockWave*. We did not seek to reach unanimous conclusions among the participants, however, a majority of participants would most likely embrace most of the findings and recommendations.

First, there is really no such thing as "foreign oil." Oil is a fungible global commodity. A change in supply or demand *anywhere* will affect prices *everywhere.*

Second, we discovered that taking such a small amount of oil off the market could have significant impact on crude oil prices and gasoline. Oil markets are currently precariously balanced. Small supply/demand imbalances can have dramatic effects. We essentially took only 3.5 million barrels off a roughly 84 million barrel global daily market. This means that a supply shortfall of approximately 4% could cause prices to rise to $161 per barrel of oil or to $5.74 per gallon of gasoline. This would create tremendous national security and economic problems for the country.

Third, the prices of crude oil rose quickly. It would not necessarily take much to go from $60 to $123 or even $161.

Fourth, once oil supply disruptions occur, little can be done in the short term to protect the US economy from its impacts. There are few good short-term solutions.

Fifth, there are a number of supply-side and demand-side policy options available that would significantly improve US oil security. Benefits from these measures will take a decade or more to mature, and thus should be enacted as soon as possible. This is the reason we must act now to end this national and economic security vulnerability.

Sixth, US foreign and military policy is influenced by—and often constrained by—US oil dependence. For example, during *Oil ShockWave*, the Saudi Arabian and the Chinese governments attempt to extract concessions out of the US in order for them to accede to US requests to help alleviate the crisis. In Segment 1, the Saudi Arabian government demands among other things that the US stop pressuring them to democratize and to stop discussing and investigating money laundering allegations and donations to al Qaeda in order to increase production capacity. In Segment 2, the Chinese government demands the US stops discussing Chinese human rights violations and stops selling weapons to Taiwan in order to accede to a request to reduce demand voluntarily. It should be noted that in both cases the *Oil ShockWave* Cabinet refused to accede to these demands.

Seventh, the Strategic Petroleum Reserve (SPR) or the emergency supply of federally owned crude oil (approximately 640 million barrels of oil) in underground salt caverns, offers at best limited protection against a major supply disruption. More importantly, determining when to use the SPR was more of an art than a science. There never seemed to be an appropriate opportunity and the Cabinet spent much time arguing when and how to release oil from the SPR. For instance, military and security were always concerned that releasing oil from the SPR could leave the US without any options if matters deteriorated further. There were also concerns that any announcement of a release of oil from the SPR could be overtaken or overshadowed by world events and thus prove meaningless as a psychological weapon. Furthermore, it was noted that releasing oil from the SPR could have the opposite effect and actually contribute to an increase in prices, as any release would be seen as confirmation about the acuteness of the crisis. Finally, the SPR is virtually meaningless in Segment 3 if Saudi Arabia is truly unable to increase production for a sustained period of time.

Eighth, the oil system is vulnerable to attacks on key energy infrastructure both overseas and at home. Because that infrastructure is simply too vast to protect, we must seek other ways to reduce this vulnerability such as reducing demand and finding alternatives to diversify fuel sources. It should be noted that during *Oil ShockWave* in Segment 2 Saudi Arabian security forces were able to foil terrorist attacks on Ras Tanura, a major oil facility. We thought it would be useful and telling to have a crisis despite the fact that Saudi Arabia was generally successful in protecting their major oil facilities. Most ominously, al Qaeda and Bin Laden have explicitly called for attacks and even attempted attacks on the oil infrastructure and by extension the Western economic system.

Ninth, the stability of the entire oil-based global economy is currently dependent on Saudi Arabia's ability to increase production dramatically and over a short time-

frame. Given existing terrorist threats and political tensions in Saudi Arabia, this situation is fraught with enormous liabilities. This does not account for the argument made by many that oil revenues have likely funded terrorism and fueled hatred against America.

Tenth, in the event of a crisis, the US has a few short-term options—such as tapping the Strategic Petroleum Reserve and implementing emergency demand measures, like carpooling, reducing speed limits, alternative drive days—as well as a number of promising long-term options—such as developing unconventional oil resources, improving fuel economy, and promoting alternative fuels. The short-term options, however, are generally good for less than a year, while the long-term options typically require a multi-year lead-time. In short, we have very few options at present for managing years two through five or ten of a prolonged oil crisis.

Conclusion

With 97% of transportation in the US fueled by oil, oil is the lifeblood of the US economy. *Oil ShockWave* demonstrated that the nation must move rapidly to protect the nation from an oil supply crisis that could have dramatic economic and national security implications.

Any meaningful interruption of global oil supplies would seriously strain the ability of the US to fund an aggressive and comprehensive war on terrorism. Key oil facilities have been attacked before, and it is virtually certain there will be more attacks. Most interestingly, it is instability, sometimes as the result of terrorism, in oil producing countries that poses such as serious threat to US oil security. (Of note, the stability of Saudi Arabia and its ability to meet short-term and long-term demand requirements are critical to the entire oil-based economy.) There are also serious questions about the use of oil revenues to fund terrorism and hatred against America.

It took a series of unsurprising events to drive the price of crude oil to $161 per barrel and the price of gasoline to $5.74 per gallon. More importantly, it only took a supply shortfall of approximately 4% or 3.5 million barrels out of a daily global market of roughly 84 million barrels to reach these prices in *Oil ShockWave.*

Unfortunately, once an oil supply disruption happens, there are no good short-term answers. It is thus essential that the President and Congress immediately implement a long-term strategy for reducing America's oil dependence. We need a concerted effort in the halls of Washington and boardrooms across the country. This is a grave national and economic security issue demanding the attention of our political and business leaders.

When we were attacked on 9/11, many people were surprised at the terrorist threat and the US vulnerability. Our response to 9/11 must be to make sure that we are not surprised again. We must anticipate and prepare for the next attack by acknowledging the vulnerabilities and addressing them. Few weaknesses demand greater attention than oil security.

Thank you.

Mr. ROYCE. Thank you, Mr. Diamond.

Mr. Dowd.

STATEMENT OF MR. JOHN P. DOWD, SENIOR RESEARCH ANALYST, SANFORD C. BERNSTEIN & COMPANY, INC.

Mr. DOWD. Good afternoon. I would like to first thank you for the opportunity to speak today. The risk of a supply disruption in the oil markets appear to be at the highest levels in history, primarily because of the thin cushion of spare capacity. With limited spare oil producing capacity, even a relatively small disruption in supply would cause shortages. This has caused oil to trade at a premium to expectations based on inventory levels, premium described as either a terror premium or a risk premium to participants in the market. This premium appears to be directly proportional to the amount of spare capacity held in reserve. If there were 6 million barrels per day of idle capacity, no single terrorist act would be sufficient to cause a shortage. The risk premium would be low. However, with only 2.2 millions barrels per day of spare capacity, and arguably less—which is about enough capacity to meet 1 year of

demand growth—the oil markets are at the mercy of political stability in Venezuela, Nigeria, Iraq, as well as potential terrorist acts.

The price of oil today is between the cost of producing it and the $100 price, in real terms, witnessed in the past during shortages. In effect, the market is factoring in some probability that a shortage will occur at some point in the future. We have included in this analysis an exhibit that presents the crude price versus expectations based on inventories, and also the crude price versus expectations based on the Bernstein oil market tightness model. In this model, we gauge risk by monitoring the ratio of spare oil capacity to demand growth. In theory, the solution is simple: If we increase the amount of spare capacity, we will reduce the risks that terrorist actions pose to the crude markets, and crude oil prices will ebb. In practice, there are several complicating factors that will likely inhibit a supply-side or demand-side solution.

On the supply side, the primary concern stems from the inability of non-OPEC producers to materially increase production. The supply response to date from higher oil prices has been anemic. Over the past two decades, the working assumption in the energy industry has been that high oil prices above $25 could not exist permanently, because doing so would invite a non-OPEC production response.

However, despite record investment, we have yet to see any significant production response. To the contrary, production growth from countries outside of OPEC and outside of the former Soviet Union has declined each decade over the past five decades. In the 1970s, these countries grew production 3.1 percent annually. Over the past decade, growth has only averaged 1.1 percent annually, even though investment has been considerably higher.

It is also becoming apparent that the hoped-for oil supply response will be impeded by a lack of necessary oil service equipment. Today there are only five competitive offshore drilling rigs that are idle and capable of going to work tomorrow. There are 421 that are working.

Spare oil capacity will probably dwindle further as a consequence of Chinese demand. While all of the growth in Chinese demand over the past decade has been offset by increased exports from the former Soviet Union, this does not appear likely going forward. Russian production growth stopped last September. This is potentially a game-changing event that will only accentuate the sensitivity of the oil markets to potential terrorist attacks.

Finally, the risk of disruptions will likely grow as the global oil supply is increasingly sourced from unstable regions. Throughout history, oil companies have taken a very rational approach to investment in which they have weighed political risk against geologic in deciding where to develop oil. One consequence is that the industry is increasingly demonstrating a propensity to invest in politically risky areas largely because the world's oil basins have matured and the geologic risks have increased.

As highlighted in the Oil ShockWave simulation, the price of oil in the U.S. is highly dependant on developments far outside of our borders. If oil demand continues to grow faster than supply, the amount of spare capacity will shrink further and the oil markets

will likely become even more sensitive to potential disturbances. For instance, if global oil consumption grows at a pace of 3.1 percent next year rather than current expectations of 2.1 percent, the amount of surplus capacity will be 830,000 barrels per day less than the current forecast. This is larger than the impact of the Nigerian disruptions cited in the first Oil ShockWave scenario.

The energy bill begins to address our dependency by promoting a diversification of energies we consume. New nuclear facilities and the increased consumption of renewable fuels will help, but refineries on former military sites would reduce dependence on gasoline, but they would only act to stimulate oil imports. Furthermore, new LNG regassification will change the type of hydrocarbons imported but not the country of origin, not the amount and not the price.

It is relatively easy to narrow down where our oil dependency lies in the U.S. It is transportation. Meaningfully reducing demand for transportation fuels is the only realistic way of gaining greater energy independence in the U.S. Improving the average fuel efficiency of the U.S. vehicle fleet by just 2 miles per gallon would reduce U.S. gasoline demand by roughly 1 million barrels per day. That is equivalent to all of the growth in U.S. gasoline consumption over the past 8 years.

In conclusion, the terror premium embedded in the crude oil price is a function of the amount of spare capacity. Any event that acts to reduce the spare capacity would likely force crude oil prices even higher. The solution appears to be a combination of policies that simultaneously diversifies the fuels the U.S. consumes, increases supply of these fuels, and reduces consumption. Thank you.

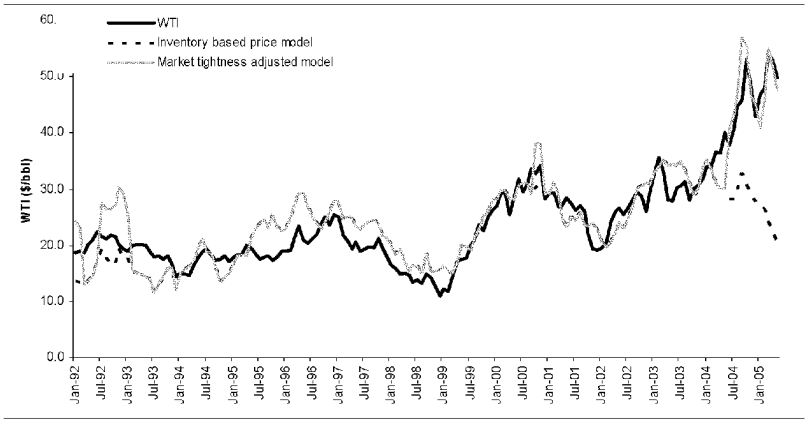
[The prepared statement of Mr. Dowd follows:]

PREPARED STATEMENT OF MR. JOHN P. DOWD, SENIOR RESEARCH ANALYST, SANFORD C. BERNSTEIN & COMPANY, INC.

Good afternoon, I would first like to thank you for the opportunity to speak today.

The risk of a supply disruption in the oil markets appears to be at one of the highest levels in history, primarily because of the thin cushion of spare capacity. With limited spare oil producing capacity, even a relatively small disruption in supply would cause shortages. This has caused oil to trade at a premium to expectations based on inventory levels, a premium described as either a "terror premium" or a "risk premium" by participants in the markets.

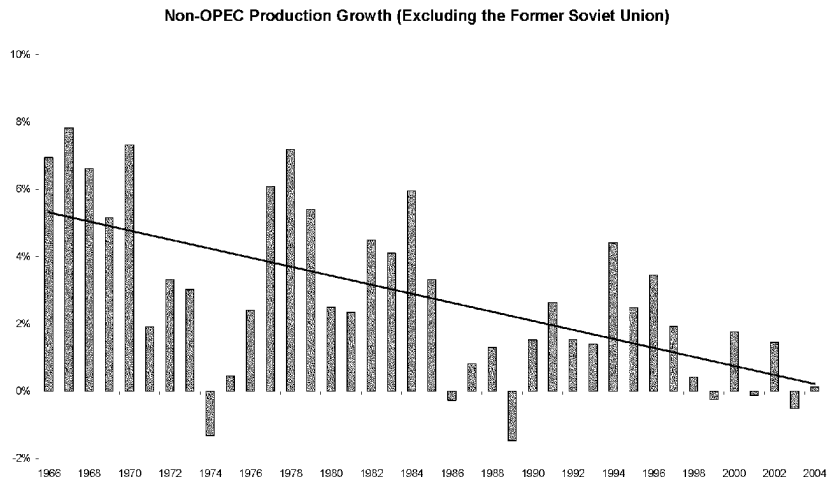
This premium appears to be directly proportional to the amount of spare productive capacity held in reserve. If there were 6 million barrels per day of idle capacity, no single terrorist act would be sufficient to cause a shortage. The risk premium would be low. However, with only 2.2 million barrels per day of spare capacity, which is enough capacity to meet a little more than one year of demand growth, the oil markets are the mercy of political stability in Venezuela, Nigeria, and Iraq, as well as potential terrorist acts. The price of oil today is between the cost of producing it, and the $100 price (in real terms) witnessed in the past during shortages. In effect, the market is factoring in some probability that a shortage will occur at some point in the future. We have included an exhibit that presents the crude price versus expectations based on inventories, and also the crude price versus expectations based on the Bernstein Oil Market Tightness Model. In this model, we gauge risk by monitoring the ratio of spare oil capacity to demand growth.



Source: IEA, DOE, Bloomberg

In theory, the solution is simple. If we increase the amount of spare capacity, we will reduce the risks that terrorist actions pose to the crude markets, and crude oil prices will ebb as a result. In practice, there are several complicating factors that will likely inhibit an effective supply-side or demand-side solution.

On the supply-side, the primary concern stems from the inability of non-OPEC producers to materially increase production. The supply response to higher oil prices has been anemic. Over the past two decades, the working assumption has been that oil prices could not permanently move above $25 because doing so would invite a non-OPEC production response. However, despite record investment, we have yet to see any significant production response. To the contrary, production growth from countries outside of OPEC and the Former Soviet Union has declined each decade over the past five. In the 1970's, these countries grew production 3.1% annually. Over the past decade, they grew production only 1.1% annually, even though investment was considerably higher.



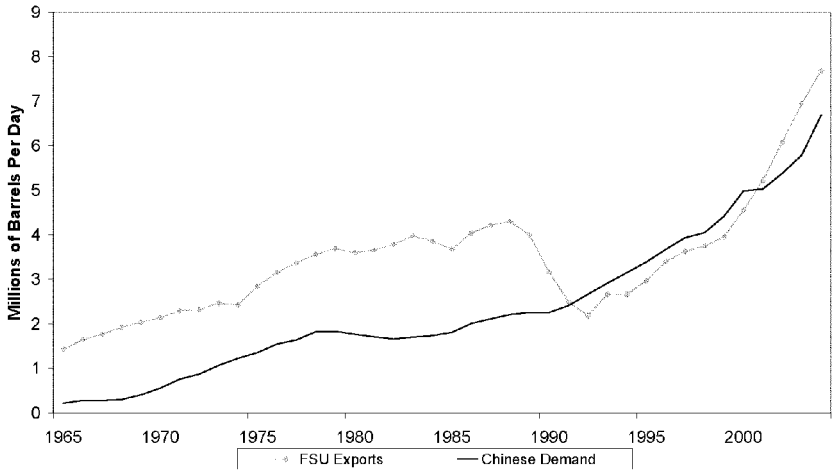
Source: BP Statistical Review 2005

It is also becoming apparent that the hoped for oil supply response will be impeded by a lack of necessary equipment. Today, there are only 5 competitive offshore drilling rigs that are idle and capable of going to work tomorrow. For context, there are 421 that are drilling. Going forward, the oil services industry is only investing

enough to expand offshore rig capacity at a rate of 3% per year. The difficulty in expanding capacity at a faster rate is that requires 3–5 years to build a modern offshore drilling rig, and between $150 million and $500 million depending on the type of equipment.

Spare oil capacity will likely dwindle further as a consequence of Chinese demand. While all of the growth in Chinese oil demand over the past decade has been offset by increased exports from the Former Soviet Union, this does not appear likely going forward. Russian production growth stopped last September. This is potentially a game changing event that will only accentuate the sensitivity of the oil markets to terrorist attacks.

Former Soviet Union (FSU) Export Growth Versus Chinese Demand Growth



Source: BP Statistical Review 2005

Finally, the risk of disruptions will likely grow as the global oil supply is increasingly sourced from unstable regions. Throughout history, oil companies have taken a very rational approach to investment, in which they have weighed political risk against geologic risk when deciding where to develop oil. One consequence is that the industry increasingly has demonstrated a propensity to invest in politically risky areas, because the world's oil basins have matured and the geologic risks have increased. As highlighted by the *Oil ShockWave* simulation, the price of oil in the US is highly dependent on developments far outside of our borders.

What is particularly worrisome is that it is not obvious that a material supply response is possible. If the US natural gas market proves to be an analog, there are reasons to be concerned. The number of drilling rigs searching for natural gas has doubled since 1996. Since that time, US natural gas production has not changed.

If oil demand continues to grow faster than supply, the amount of spare capacity will shrink further and the oil markets will likely become even more sensitive to potential disturbances. For instance, if global oil consumption grows at a pace of 3.1% next year rather than current expectations of 2.1%, the amount of surplus capacity will be 830,000 barrels per day less than the current forecast. This is larger than the impact of the Nigerian disruptions sited in the first *Oil ShockWave* scenario.

The Energy Bill of 2005 begins to address our dependency by promoting a diversification of the energies we consume. New nuclear facilities and the increased consumption of renewable fuels will help. The developing technologies promoted by the Bill are also promising, but are unlikely to make a meaningful impact in the near to medium term. New refineries on former military sites would reduce dependence on gasoline imports, but would only act to stimulate oil imports. Furthermore, new LNG regassification will change the type of hydrocarbon imported, but not the country of origin, the amount, or the price (given the existing competition between oil and natural gas). By the end of the decade, roughly half of LNG liquefaction will be located in OPEC countries.

It is relatively easy to narrow down where our oil dependency lies in the US: transportation. Meaningfully reducing demand for transportation fuels is the only realistic way of gaining greater energy independence in the US. The challenge is that the obvious solution, encouraging the use of diesel fuels and the use of more fuel efficient vehicles, is also politically the most difficult. However, the potential is huge. Improving the average fuel efficiency of the US vehicle fleet by just 2 mpg would reduce US gasoline demand by roughly 1 million barrels per day. This is equivalent to all of the growth in US gasoline consumption over the past 8 years.

In conclusion, the "terror premium" embedded in the crude price is a function of the amount of spare oil capacity. Any event that acts to reduce the amount of spare capacity would likely force crude oil prices even higher. The solution appears to be a combination of policies that simultaneously diversify the fuels the US consumes, increases the supply of these fuels, and reduces consumption.

Thank you.

Mr. ROYCE. Thank you, Mr. Dowd.

Dr. Luft.

STATEMENT OF GAL LUFT, PH.D., CO-DIRECTOR, INSTITUTE FOR THE ANALYSIS OF GLOBAL SECURITY

Mr. LUFT. Thank you, Mr. Chairman, Members of the Committee. Thank you.

I agree with my friends that oil terrorism is an imminent threat to global economy and security. In the past 4 years, the Institute for Analysis of Global Security has been monitoring and recording hundreds of attacks against energy facilities worldwide. In Iraq alone, there have been more than 250 attacks against pipelines and refineries since the end of major hostilities.

We also see a similar problem, though on a smaller scale, in many other energy domains such as Russia. There was an attack this week on a gas pipeline at Azerbaijan, Pakistan, Saudi Arabia, Sudan, Turkey, Indonesia, Colombia and Nigeria. No doubt the terrorists have identified oil as the Achilles heel of global economy and they work to exploit this vulnerability.

The reality of lack of spare capacity, lack of liquidity, really plays into the hands of terrorists who want to hurt the Western economy. The war on radical Islam is often being described as an ideological or even religious war, but for the jihadist, it is also an economic war. Osama bin Laden's strategy is based on the conviction that the way to bring down a superpower is to weaken its economy through a protected guerilla warfare. In his October 2004 videotape he boasted, and I quote:

> "We bled Russia for 10 years until it went bankrupt and was forced to withdraw from Afghanistan in defeat. We are continuing in the same policy to make America bleed profusely to the point of bankruptcy."

Striking pipelines, tankers, refineries, and oil fields is easy and effective. Terrorists no longer need to come to the United States, deal with the FBI and INS, and wreak havoc in our cities. They can cause economic damage by hitting our energy supply at the generating points where they enjoy strong support on the ground. These attacks have already imposed a "fear premium" in the oil market of anywhere between $10 and $15 a barrel, which for the U.S., this fear premium alone costs us more than $60 billion a year.

Higher oil prices also mean a transfer of wealth of historical proportions from oil-consuming countries to the Muslim world where

three-quarters of global oil reserves are concentrated. The windfall benefits jihadists as petrol dollars trickle their way through charities and government handouts to madrassas and mosques.

Mr. Chairman, to me this situation is tantamount to our sending billions of dollars to Japan and Nazi Germany during World War II. The most popular targets are pipelines, as you mentioned, pipeline sabotage. It is not a mere nuisance as some people tend to think. In Iraq these attacks have had strategic impacts on United States efforts. They undermine the prospects of Iraqi reconstruction by denying the Iraq economy the much-needed oil revenues. They also have corrosive influence on the morale of the Iraqis and their attitude toward the United States presence in their country. Worse, the sabotage campaign has created an inhospitable investment climate in Iraq and scared away oil companies that were supposed to develop Iraq's oil industry.

My main concern is that terrorists will try to replicate their success in Iraq and shift their effort into Saudi Arabia. A terror attack in one of Saudi Arabia's big oil installations like Abqaiq or Ras Tanura is not a fictional scenario. It has been attempted before, and it is clear that there is no shortage of people who are willing to sacrifice their lives to meet this end.

Now the vulnerability, as mentioned, is at sea. We are seeing a growing evidence that terrorists find the unpoliced sea to be their preferred domain of operation, and they are after large crude carriers, LNG tankers, and chemical tankers. Most of the chokepoints, whether the Strait of Hormuz, Bab el-Mandab, the Strait of Malacca, Bosporus, all of them are in areas where Islamic fundamentalism is prevalent. And all of these points have witnessed terrorist attempts against shipping.

And I would like to ask you to add to the record a *Foreign Affairs* article that was published in November that enumerates the threats and what can be done to prevent them.

Mr. ROYCE. Without objection.

[The information referred to follows:]

TERRORISM GOES TO SEA

By Gal Luft and Anne Korin
Foreign Affairs, November/December 2004

Summary: The number of pirate attacks worldwide has tripled in the past decade, and new evidence suggests that piracy is becoming a key tactic of terrorist groups. In light of al Qaeda's professed aim of targeting weak links in the global economy, this new nexus is a serious threat: most of the world's oil and gas is shipped through pirate-infested waters.

A NEW NEXUS

Since the attacks of September 11, 2001, security experts have frequently invoked a 200-year-old model to guide leaders contending with the threat of Islamist terrorism: the war on piracy. In the first years of the nineteenth century, Mediterranean pirates, with the support of the Barbary states of northern Africa, would capture merchant ships and hold their crews for ransom. In response, the United States launched the Barbary wars, the first successful effort by the young republic to protect its citizens from a ruthless, unconventional enemy by fighting a protracted struggle overseas.

Such experts, however, fail to realize that the popular perception that the international community has eliminated sea piracy is far from true. Not only has piracy never been eradicated, but the number of pirate attacks on ships has also tripled in the past decade-putting piracy at its highest level in modern history. And contrary to the stereotype, today's pirates are often trained fighters aboard speedboats

equipped with satellite phones and global positioning systems and armed with automatic weapons, antitank missiles, and grenades.

Most disturbingly, the scourges of piracy and terrorism are increasingly intertwined: piracy on the high seas is becoming a key tactic of terrorist groups. Unlike the pirates of old, whose sole objective was quick commercial gain, many of today's pirates are maritime terrorists with an ideological bent and a broad political agenda. This nexus of piracy and terrorism is especially dangerous for energy markets: most of the world's oil and gas is shipped through the world's most piracy-infested waters.

ROUGH WATERS

Water covers almost three-quarters of the globe and is home to roughly 50,000 large ships, which carry 80 percent of the world's traded cargo. The sea has always been an anarchic domain. Unlike land and air, it is barely policed, even today.

Since many shipping companies do not report incidents of piracy, for fear of raising their insurance premiums and prompting protracted, time-consuming investigations, the precise extent of piracy is unknown. But statistics from the International Maritime Bureau (IMB), a piracy watchdog, suggest that both the frequency and the violence of acts of piracy have increased in recent years. In 2003, ship owners reported 445 attacks, in which 92 seafarers were killed or reported missing and 359 were assaulted and taken hostage. (Ships were hijacked in 19 of these cases and boarded in 311.) From 2002 to 2003, the number of those killed and taken hostage in attacks nearly doubled. Pirates have also increased their tactical sophistication, often surrounding a target ship with several boats and firing machine guns and antitank missiles to force it to stop. As Singapore's Deputy Prime Minister Tony Tan recently warned, "piracy is entering a new phase; recent attacks have been conducted with almost military precision. The perpetrators are well-trained, have well laid out plans." The total damage caused by piracy—due to losses of ships and cargo and to rising insurance costs—now amounts to $16 billion per year.

Many pirates, especially those in eastern Asia, belong to organized crime syndicates comprising corrupt officials, port workers, hired thugs, and businessmen who dispose of the booty. Grossly underpaid maritime security personnel have also begun to enter the business; many are complicit, and some are actively involved, in attacks.

Pirates and Islamist terrorist groups have long operated in the same areas, including the Arabian Sea, the South China Sea, and in waters off the coast of western Africa. Now, in the face of massive international efforts to freeze their finances, terrorist groups have come to view piracy as a potentially rich source of funding. This appeal is particularly apparent in the Strait of Malacca, the 500-mile corridor separating Indonesia and Malaysia, where 42 percent of pirate attacks took place in 2003. According to Indonesia's state intelligence agency, detained senior members of Jemaah Islamiyah, the al Qaeda-linked Indonesian terrorist group, have admitted that the group has considered launching attacks on Malacca shipping. And uniformed members of the Free Aceh Movement, an Indonesian separatist group that is also one of the most radical Islamist movements in the world, have been hijacking vessels and taking their crews hostage at an increasing rate. The protracted ransom negotiations yield considerable sums—the going rate is approximately $100,000 per ship—later used to procure weapons for sustained operations against the Indonesian government. In some cases, the Free Aceh Movement has demanded the release of members detained by the government in exchange for hostages.

The string of maritime attacks perpetrated in recent years demonstrates that terror has indeed gone to sea. In January 2000, al Qaeda attempted to ram a boat loaded with explosives into the USS The Sullivans in Yemen. (The attack failed only because the boat sank under the weight of its lethal payload.) After this initial failure, al Qaeda suicide bombers in a speedboat packed with explosives blew a hole in the USS Cole, killing 17 sailors, in October 2000. In October 2002, an explosives-laden boat hit the French oil tanker Limburg off the coast of Yemen. In February 2004, the southern Philippines-based Abu Sayyaf claimed responsibility for an explosion on a large ferry that killed at least 100 people. And according to FBI Director Robert Mueller, "any number of attacks on ships have been thwarted." In June 2002, for example, the Moroccan government arrested a group of al Qaeda operatives suspected of plotting raids on British and U.S. tankers passing through the Strait of Gibraltar.

Terrorist groups such as Hezbollah, Jemaah Islamiyah, the Popular Front for the Liberation of Palestine-General Command, and Sri Lanka's Tamil Tigers have long sought to develop a maritime capability. Intelligence agencies estimate that al Qaeda and its affiliates now own dozens of phantom ships—hijacked vessels that

have been repainted and renamed and operate under false documentation, manned by crews with fake passports and forged competency certificates. Security experts have long warned that terrorists might try to ram a ship loaded with explosive cargo, perhaps even a weapon of mass destruction, into a major port or terminal. Such an attack could bring international trade to a halt, inflicting multi-billion-dollar damage on the world economy.

BLACK GOLD

Following the attack on the Limburg, Osama bin Laden released an audio tape warning of attacks on economic targets in the West: "By God, the youths of God are preparing for you things that would fill your hearts with terror and target your economic lifeline until you stop your oppression and aggression." It is no secret that one of the most effective ways for terrorists to disrupt the global economy is to attack oil supplies—in the words of al Qaeda spokesmen, "the provision line and the feeding artery of the life of the crusader nation."

With global oil consumption at 80 million barrels per day and spare production capacity gradually eroding, the oil market has little wiggle room. As a result, supply disruptions can have a devastating impact on oil prices—as terrorists well know. U.S. Energy Secretary Spencer Abraham has repeatedly warned that "terrorists are looking for opportunities to impact the world economy" by targeting energy infrastructure. In recent years, terrorists have targeted pipelines, refineries, pumping stations, and tankers in some of the world's most important energy reservoirs, including Iraq, Nigeria, Saudi Arabia, and Yemen.

In fact, since September 11, 2001, strikes on oil targets have become almost routine. In October 2001, Tamil Tiger separatists carried out a coordinated suicide attack by five boats on an oil tanker off northern Sri Lanka. Oil facilities in Nigeria, the United States' fifth-largest oil supplier, have undergone numerous attacks. In Colombia, leftist rebels have blown so many holes in the 480-mile Cãno Limón-Coveña pipeline that it has become known as "the flute." And in Iraq, more than 150 attacks on the country's 4,000-mile pipeline system have hindered the effort to resume oil production, denying Iraqis funds necessary for the reconstruction effort. In April 2004, suicide bombers in three boats blew themselves up in and around the Basra terminal zone, one of the most heavily guarded facilities of its kind in the world.

Particularly vulnerable to oil terrorism is Saudi Arabia, which holds a quarter of the globe's oil reserves and, as the world's leading exporter, accounts for one-tenth of daily oil production. Al Qaeda is well aware that a successful attack on one of the kingdom's major oil facilities would rattle the world and send oil prices through the ceiling. In the summer of 2002, a group of Saudis was arrested for plotting to sabotage the world's largest offshore oil-loading facility, Ras Tanura, through which up to a third of Saudi oil flows. More recently, in May 2004, jihadist gunmen opened fire on foreign workers in Yanbu, Saudi Arabia's petrochemical complex on the Red Sea, killing five foreign nationals. Later in the same month, Islamic extremists seized and killed 22 foreign oil workers in the Saudi city of Khobar. All of these attacks caused major disruptions in the oil market and a spike in insurance premiums, bringing oil prices to their highest level since 1990.

Whereas land targets are relatively well protected, the super-extended energy umbilical cord that extends by sea to connect the West and the Asian economies with the Middle East is more vulnerable than ever. Sixty percent of the world's oil is shipped by approximately 4,000 slow and cumbersome tankers. These vessels have little protection, and when attacked, they have nowhere to hide. (Except on Russian and Israeli ships, the only weapons crewmembers have today to ward off attackers are high-powered fire hoses and spotlights.)

If a single tanker were attacked on the high seas, the impact on the energy market would be marginal. But geography forces the tankers to pass through strategic chokepoints, many of which are located in areas where terrorists with maritime capabilities are active. These channels—major points of vulnerability for the world economy—are so narrow at points that a single burning supertanker and its spreading oil slick could block the route for other vessels. Were terrorist pirates to hijack a large bulk carrier or oil tanker, sail it into one of the chokepoints, and scuttle it to block the sea-lane, the consequences for the global economy would be severe: a spike in oil prices, an increase in the cost of shipping due to the need to use alternate routes, congestion in sea-lanes and ports, more expensive maritime insurance, and probable environmental disaster. Worse yet would be several such attacks happening simultaneously in multiple locations worldwide.

The Strait of Hormuz, connecting the Persian Gulf and the Arabian Sea, is only 1.5 miles wide at its narrowest point. Roughly 15 million barrels of oil are shipped

through it daily. Between 1984 and 1987, when tankers were frequently attacked in the strait, shipping in the gulf dropped by 25 percent, causing the United States to intervene militarily. Since then, the strait has been relatively safe, but the war on terrorism has brought new threats. In his 2003 State of the Union address, President George W. Bush revealed that U.S. forces had already prevented terrorist attacks on ships there. Bab el Mandeb, the entrance to the Red Sea and a conduit for 3.3 million barrels per day, also is only 1.5 miles wide at its narrowest point. The Bosporus, linking the Black Sea to the Mediterranean, is less than a mile wide in some areas; ten percent of the 50,000 ships that pass through it each year are tankers carrying Russian and Caspian oil.

According to the IMB, however, the most dangerous passage of all is the Strait of Malacca. Every day, a quarter of world trade, including half of all sea shipments of oil bound for eastern Asia and two-thirds of global shipments of liquefied natural gas, passes through this strait. Roughly 600 freighters loaded with everything from Japanese nuclear waste bound for reprocessing facilities in Europe to raw materials for China's booming economy traverse this chokepoint daily. Roughly half of all piracy attacks today occur in Southeast Asia, mostly in Indonesian waters. Singapore's defense minister, Teo Chee Hean, has said that security along the strait is "not adequate" and that "no single state has the resources to deal effectively with this threat." Any disruption of shipping in the South China Sea would harm not only the economies of China, Japan, South Korea, Taiwan, and Hong Kong, but that of the United States as well.

Ominously, there have been cases of terrorist pirates hijacking tankers in order to practice steering them through straits and crowded sea-lanes—the maritime equivalent of the September 11 hijackers' training in Florida flight schools. These apparent kamikazes-in-training have questioned crews on how to operate ships but have shown little interest in how to dock them. In March 2003, an Indonesian chemical tanker, the Dewi Madrim, was hijacked off Indonesia. The ten armed men who seized the vessel steered it for an hour through the busy Strait of Malacca and then left the ship with equipment and technical documents.

POLICING THE SEA

If September 11 holds any lesson, it is the folly of complacency in the face of an emerging threat. Since the attacks, much has been done to improve maritime security in the industrialized world, where millions of containers are handled every year. But isolated local measures will not suffice. International terrorists who want to cripple the global economy need not bother attacking countries where security is tight. They can inflict the same damage by targeting the territorial waters of countries that lack the will or the resources to police their own maritime backyard.

Despite problems of state sovereignty and overlapping jurisdiction, several steps can be taken to help protect maritime trade and energy markets, as well as to help nations begin to break the forming nexus between piracy and terrorism. These measures should be taken not only by littoral countries or countries located near strategic chokepoints, but also by those who derive economic benefits from an uninterrupted trade system.

Ultimately, only a ship can guarantee its own security. Maritime security forces cannot be present everywhere at all times (and in certain regions the security forces themselves are the problem). Vessels must contend with two types of attack: ramming by a suicide boat and hijacking. The first is very difficult to defend against. The second is easier to deter.

By international agreement, as of July 2004, ships above 500 tons must be equipped with alarm systems that silently transmit security alerts containing tracking information in case of emergency. Vessels are also required to emboss their International Maritime Organization (IMO) number on their hulls. And since 2003, ship owners have been able to install high-voltage electric fencing to discourage intruders (although ships carrying highly volatile cargo—including oil—cannot use such fencing).

At a time when the U.S. Congress has decided to enable airline pilots to carry weapons, it is worth examining a similar policy for officers on civilian ships. Arming sailors is more complicated than simply giving them weapons. Officers must be well trained, access to onboard weapons storage must be carefully controlled, and crews must be well vetted. The long-standing (and, in the short term, financially expedient) practice of crewing ships with unfamiliar developing-world crews hired at various ports of call also requires scrutiny—in many hijackings, "insiders" planted on the ships facilitate the attacks.

International law treats pirates in the same way it treats terrorists: as enemies of mankind. The UN Convention on the Law of the Sea enjoins the international

community to cooperate in the repression of piracy on the high seas, allowing any state to seize pirate ships or ships under pirates' control. Once pirates are apprehended on the high seas, the seizing power has the authority to determine their penalties.

Although the convention is the accepted standard in international maritime law and was ratified by 145 nations, it has not yet been ratified by the United States. Some opponents of the convention fear that it would compromise U.S. intelligence-collection efforts in the territorial waters of sovereign nations. Others, such as General Richard Myers, chairman of the Joint Chiefs of Staff, hold that the convention remains "a top national security priority. . . . It supports efforts in the War on Terrorism by providing much needed stability and operational maneuver space, codifying essential navigational and overflight freedoms." Regardless, the convention itself would far from solve the problem. Most of the attacks on merchant vessels are not committed on the high seas but within the jurisdiction of states, often while the ship is berthed or anchored. Navies of foreign countries are normally forbidden to chase pirates across national boundaries, in what is known as the "right of hot pursuit." This is of particular concern in areas such as the Strait of Malacca, where pirates often rapidly escape from one country's territorial waters to another's, leaving frustrated security forces in their wake.

A more operationally oriented instrument of cooperation is the Regional Maritime Security Initiative (RMSI) currently under discussion among Asian nations. This initiative aims to combat the transnational threats of maritime piracy and terrorism in the Strait of Malacca and the Singapore Strait by introducing joint naval exercises and other mechanisms for information sharing and cooperation on law enforcement operations. An additional objective of the RMSI is to monitor, identify, and intercept suspected vessels in national and international waters. This, however, requires strong naval forces, and the navies of countries affected by maritime terror are not up to the task. The Indonesian navy, which faces the biggest challenge in terms of maritime terrorism, is aging and has few warships and resources to patrol the vast coastline and periphery of its 17,000 islands. Only 30 percent of its 117 ships are seaworthy. The situation in Malaysia is not much better. With such insufficient maritime power, the two countries in charge of securing the passage to Asia are clearly incapable of doing it alone.

Bolstering the capabilities of these navies would be a lengthy and expensive project. Until this happens, the United States is one of the few countries capable of supplying substantial forces to patrol the sea. But by no means can the United States secure shipping in these straits on its own. Countries such as China, India, Japan, and South Korea, whose entire oil supply from the Middle East must traverse pirate-infested waters, are important beneficiaries of secure sea-lanes, yet their contributions to maritime security leave much to be desired. Moreover, few states in the region are eager for a large U.S. military presence in their waters. When Washington floated the option of U.S. naval vessels patrolling the Strait of Malacca, both Indonesia and Malaysia responded with concerns that such a presence would itself become a lightning rod for radical Islamic groups, inviting more attacks both at sea and against each government.

The recent crackdown on terrorist financing has required states to increase their vigilance of money laundering. Similarly, states must come together to levy sanctions against third parties that facilitate hijacking. Existing measures are insufficient to ensure that hijacked ships are not able to operate under what are known as "flags of convenience." Countries such as Liberia, Malta, and Panama provide what amount to flags for hire—enabling dubious companies to register ships that they do not own. Although the IMO has agreed on "Measures to Prevent the Registration of 'Phantom' Ships," these measures have no teeth and must be strengthened. If a state cannot ensure that the ships it is flagging are legitimate, then all of the ships flying its flag should be blacklisted and prevented from entering the territorial waters of other states. If international agreements cannot be put into place to enforce this measure, then consumer countries must consider implementing such blacklists independently. This is not at all a trivial task, as the majority of cargo shipped to and from the United States is transported on ships sailing under foreign flags.

ALTERNATIVE ROUTES

As with the broader war on terrorism, the war on terrorists at sea will require a long-term effort and may take decades to win. Major energy consumers and producers should thus focus not only on ways to fight terror at sea, but also on how to better cushion the blow to their economies in the case of a major disruption of

oil traffic. They should, for example, expand strategic petroleum reserves so that they are sufficient to replace many weeks of lost imports.

Projects designed to bypass the dangerous chokepoints, or at least reduce some of the traffic through them, are no less important. Thailand, for example, aims to replace Singapore as Asia's energy-trading hub by building a "Strategic Energy Land Bridge"—an alternative route that cuts across the Isthmus of Kra, which separates the Andaman Sea from the Gulf of Thailand. The project includes two oil terminals, storage depots, and a 150-mile pipeline to the gulf, where tankers will be waiting to ship the oil to northern Asia. This would not only cut more than 600 miles off the shipping distance for Middle Eastern oil bound for eastern Asia, but also allow shippers to bypass the Strait of Malacca. In the same vein, to reduce pressure on the Strait of Hormuz, the oil pipeline that traverses Israel could be expanded. Russian oil from the Black Sea enters the pipeline at the Israeli port of Ashqelon on the Mediterranean coast and flows to Elat on the Red Sea, where it is loaded onto tankers and shipped to Asia. This route provides a much shorter link between the Mediterranean and Asia.

Most important, as the world's energy supply is likely to remain a terrorist target, the risk must be reduced not only by improving the security of ocean thruways, but also by looking inward: by replacing imported energy with next-generation energy derived from domestic energy resources. Such a shift would increase energy independence for the free world and minimize the need to transport oil across the globe—thus reducing the world's vulnerability to a catastrophic disruption of its energy supply by terrorists at sea.

Gal Luft is executive director of the Institute for the Analysis of Global Security (IAGS). Anne Korin is director of policy and strategic planning at IAGS and editor of Energy Security.

Mr. LUFT. Now, though energy terrorism is on the rise, it is important, Mr. Chairman, that we don't underestimate the resilience of the U.S. economy and that we don't scare ourselves to death by various nightmare scenarios that are occasionally being offered to the public. No doubt that oil terrorism could drive oil prices to over $100 a barrel, but the impact of such disruptions is likely to be short-lived.

If we look at the statistics, the average duration of supply disruption of the past 55 years were 6 months, with loss of no more than 2½ percent of the market.

Most pipelines and pumping stations can be repaired within a few days or weeks. A blockage of a chokepoint by a burning tanker is not likely to last more than a couple of weeks. Once the disruption ends, prices are likely to be gradually restored. It is important to remember that a loss of 4 to 5 percent of the market can be offset by the 700-million-barrel Strategic Petroleum Reserve. At a rate of 1 million barrels per day, the SPR can supply U.S. needs for more than a 1½ years. And I don't see a disruption lasting more than 1½ years on the horizon.

In addition, simple behavioral changes which can be introduced in time of emergency can more than offset the damage caused by such supply disruption. There is a report just issued by the International Energy Agency that verifies just that.

There are some solutions we need to implement in order to insulate our economy against supply disruptions, the most important of which is to continue to pursue terrorists wherever they are. But there are many measures we must adopt, both domestically as well as internationally, to reduce our vulnerability to oil kamikazes who seek to cut our economic jugular. I enumerated them in my written testimony, and I would be glad to address them in more detail. Thank you.

[The prepared statement of Mr. Luft follows:]

PREPARED STATEMENT OF GAL LUFT, PH.D., CO-DIRECTOR, INSTITUTE FOR THE ANALYSIS OF GLOBAL SECURITY

Mr. Chairman, Members of the Committee, my name is Gal Luft. I am executive director of the Institute for the Analysis of Global Security (IAGS), an energy security think tank which follows and analyzes the relations between energy and our national and international security. I would like to thank you for inviting me to brief you on the issue of terrorist threats to energy security.

Since September 11 it has become increasingly apparent that terrorist groups have identified the world energy system as the Achilles heel of the West. Throughout the world jihadist terrorists attack oil and gas installations almost on a daily basis with significant impact on the oil market.

Goals

What makes oil interesting for terrorists are the unique conditions that have been created in the oil market in recent years. Until recently, the oil market had sufficient wiggle room to deal with occasional supply disruptions. Such disruptions could be offset by the spare production capacity owned by some OPEC producers, chiefly Saudi Arabia. This spare capacity has been the oil market's main source of liquidity. But due to the sudden growth in demand in developing Asia this liquidity mechanism has eroded from 7mbd in 2002 which constituted 9% of the market to about 1.5 mbd today, less than 2%. As a result, the oil market today resembles a car without shock absorbers: the tiniest bump on the road can send a passenger to the ceiling. Without liquidity, the only one mechanism left to bring the market to equilibrium is rapid and uncontrolled price increases.

This reality plays into the hands of terrorists who want to hurt the Western economy. The war on radical Islam is often described as an ideological or even religious war. But for the jihadists it is also an economic war. Osama bin Laden's strategy is based on the conviction that the way to bring down a superpower is to weaken its economy through protracted guerilla warfare. We "bled Russia for ten years until it went bankrupt and was forced to withdraw [from Afghanistan] in defeat. [. . .] We are continuing in the same policy to make America bleed profusely to the point of bankruptcy," bin Laden boasted in his October 2004 videotape.

His logic, while based on faulty assumptions, is simple: To bring the U.S. to suffer a fate similar to that of the Soviet Union, the terrorists need to drain America's resources and bring it to the point it can no longer afford to preserve its military and economic dominance. As the U.S. loses standing in the Middle East, the jihadists can gain ground and remove from power regimes they view as corrupt and illegitimate while defeating other infidels who inhabit the land of Islam. One of the Islamists' methods to achieve this goal is to attack oil, which jihadists call "the provision line and the feeding to the artery of the life of the crusader's nation." Even though the Islamist goal of bankrupting the U.S. stretches the imagination, the fact that they strive for it means we must take it into account in planning a counterstrategy.

Striking pipelines, tankers, refineries and oil fields is easy and effective. Terrorists no longer need to come to the U.S. and wreak havoc in our cities. They can cause enormous economic damage by hitting our energy supply at the generating points, where they enjoy strong support on the ground. These attacks have already imposed a "fear premium" in the oil market of $10–$15. For the U.S., an importer of more than 11 million barrels a day, this fear premium alone costs $40–$60 billion a year. The cause and effect are not lost on terrorists. "We call our brothers in the battlefields to direct some of their great efforts towards the oil wells and pipelines," reads a jihadist website. "The killing of 10 American soldiers is nothing compared to the impact of the rise in oil prices on America and the disruption that it causes in the international economy."

Higher oil prices also mean a transfer of wealth of historical proportions from oil-consuming countries—primarily the U.S.—to the Muslim world, where three quarters of global oil reserves are concentrated. The windfall benefits jihadists as petrodollars trickle their way through charities and government handouts to madrassas and mosques.

Methods

The most popular targets are pipelines, through which about 40% of world's oil flows. They run over thousands of miles and across some of the most volatile areas in the world. Pipelines are very easily sabotaged. A simple explosive device can put a critical section of pipeline out of operation for weeks. This is why pipeline sabotage has become the weapon of choice of the insurgents in Iraq. The Institute for the Analysis of Global Security maintains a database of all attacks against energy facilities. According to the Institute's Iraq Pipeline Watch (www.iags.org/

iraqpipelinewatch.htm) there have been more than 250 pipeline attacks in Iraq since President Bush declared the end of major hostilities in April 2003.

These attacks have strategic impact on U.S. efforts in Iraq. They undermined the prospects of Iraqi construction by denying the Iraqi economy much needed oil revenues. They also have a corrosive influence on the morale of the Iraqis and their attitude toward the presence of U.S. forces in their country. Iraqis are growing increasingly vexed by the slow progress in the reconstruction effort and the inability of the government to guarantee a reliable supply of electricity, which is primarily derived from oil. Worse, the sabotage campaign has created an inhospitable investment climate in Iraq and scared away oil companies that were supposed to develop its oil and gas industry.

Emulating the success of the saboteurs in Iraq, terrorists in many oil-producing countries have set their sights on and attacked pipelines and other oil installations in Sudan, Chechnya, India, Saudi Arabia, Pakistan, Turkey, Colombia, Nigeria, Azerbaijan, Indonesia and the Philippines.

Terror at sea

There is growing evidence that terrorists find the unpoliced sea to be their preferred domain of operation. Terrorist groups such as al Qaeda, Hezbollah, Jemaah Islamiyah, the Popular Front for the Liberation of Palestine-General Command, and Sri Lanka's Tamil Tigers have long sought to develop a maritime capability.

Today, over 60% of the world's oil and almost all of its liquefied natural gas is shipped on 3,500 tankers through a small number of 'chokepoints'—straits and channels narrow enough to be blocked, and vulnerable to piracy and terrorism. The most important chokepoints are the Strait of Hormuz, through which 13 million barrels of oil are moved daily, Bab el-Mandab, which connects the Red Sea to the Gulf of Aden and the Arabian Sea, and the Strait of Malacca, between Indonesia and Malaysia. Thirty percent of the world's trade and 80% of Japan's crude oil passes through the latter, including half of all sea shipments of oil bound for East Asia and two-thirds of global liquefied natural gas shipments. The Bosporus, linking the Black Sea to the Mediterranean, is less than a mile wide in some areas and is one of the most threatened chokepoints. Ten percent of the 50,000 ships that pass through it each year are tankers carrying Russian and Caspian oil.

Most of the critical chokepoints are located in areas where Islamic fundamentalism is prevalent. The Strait of Hormuz is controlled by Iran; Bab el-Mandab is controlled by Yemen, the ancestral home of bin Laden. Part of the 500-mile long Strait of Malacca courses through Indonesia's oil rich province Aceh, inhabited by one of the world's most radical Muslim populations.

Many terror experts have expressed concern that al Qaeda might seize a ship or a boat or even a one-man submarine and crash it into a supertanker in one of the chokepoints. Were terrorists to attack such a vessel the resulting explosion and spreading stain of burning oil could shut down the channel with a profound impact on the oil market. Tankers are too slow and cumbersome to maneuver away from attackers; they have no protection and they have nowhere to hide. al Qaeda terrorists have demonstrated repeatedly their intent and ability to strike them. In January 2000 al Qaeda attempted to ram a boat loaded with explosives into the USS The Sullivans in Yemen. The attack was aborted when the boat sank under the weight of the explosives. Later, in October, al Qaeda suicide bomber in high-powered speedboat packed with explosives blew a hole in the USS Cole, killing 17 sailors. In June 2002, a group of al Qaeda operatives suspected of plotting raids on British and American tankers passing through the Strait of Gibraltar was arrested by the Moroccan government; and in October that year, the organization badly holed a French supertanker off the coast of Yemen. According to FBI Director Robert Mueller "any number of [terror] attacks on ships . . . have been thwarted."

To make things worse, there are increasing signs of collaboration between terrorists and pirates. According to International Maritime Bureau (IMB), pirate attacks on ships have tripled in the last decade. Each year 350–400 piracy attacks take place worldwide in which hundreds of seafarers are being killed, assaulted, or kidnapped. The majority of the attacks take place in the Philippines, Indonesia, Bangladesh and Nigeria. Most of the ships attacked are oil and chemical tankers. Maritime security experts have repeatedly warned about the collusion between piracy and terror, voicing concerns that Islamist groups operating in these regions could capitalize on the disorder and target strategic chokepoints by placing a bomb on a supertanker or ramming a ship into one.

Mr. Chairman,

The threat against energy facilities worldwide is severe and not a day goes by without us being reminded of it. Governments, oil companies and pipeline operators are seeking to put in place mechanisms to reduce the impact of the scourge. They

are forced to invest increasing sums of money to improve security in their oil installations. We are paying for this at the pump.

No doubt supply disruptions described above could drive oil prices further to where they are today and take a toll of our economy. But the impact of such disruptions is not likely to be long lasting. The average duration of the 14 supply disruptions as a result of accidents and internal political struggles of the past 55 years is 6 months with loss of no more than 2.5% of the market. Most pipelines and pumping stations can be repaired within few days or weeks. A blockage of a chokepoint by a burning tanker is not likely to last more than a couple of weeks. Once the disruption ends prices are likely to be gradually restored. It is important to remember that a loss of 4–5% of supply to the U.S. market can be offset by the 700mb Strategic Petroleum Reserve (SPR). At a rate of 1 million barrels per day the SPR can supply U.S. needs for more than a year and a half. The Energy Policy and Conservation Act (EPCA), which governs the usage of the SPR, allows for a limited drawdown for circumstances which constitute "a domestic or international energy supply shortage of significant scope or duration." In addition, simple behavioral changes which can be introduced in a time of emergency. According to the International Energy Agency a number of measures like sensible driving, car pooling, removal of excess weight, engine tuning, tire inflation, replacement of air filters and idling reduction of trucks and planes could provide substantial reductions in transport oil use quickly and cheaply. It has been demonstrated that a speed reduction of 12mph can reduce fuel consumption by approximately 20% and a tire inflation public awareness campaign could save approximately 3%.

But one scenario our economy cannot withstand is a major attack on one of Saudi Arabia's oil facilities. In addition to being holder of a quarter of the world's oil reserves holder of most of the world's spare production capacity Saudi Arabia is the only country in the world that has facilities that process more than 3mbd. Over half of Saudi Arabia's oil reserves are contained in just eight fields and about two-thirds of Saudi Arabia's crude oil is processed in a single enormous facility called Abqaiq, 25 miles inland from the Gulf of Bahrain. On the Persian Gulf, Saudi Arabia has just two primary oil export terminals: Ras Tanura—the world's largest offshore oil loading facility, through which a tenth of global oil supply flows daily—and Ras al-Ju'aymah. On the Red Sea, a terminal called Yanbu is connected to Abqaiq via the 750-mile East-West pipeline.

The Saudi oil system is target rich and extremely vulnerable to terrorist acts. This is not only due to al Qaeda's strong presence in the kingdom and its ability to carry out coordinated attacks but also because of the number of strategic targets. A terrorist attack on each one of the hubs of the Saudi oil complex or a simultaneous attack on a few of them is not a fictional scenario. In summer 2002, a group of Saudis was arrested for involvement in a plot to sabotage Ras Tanura and pipelines connected to it. A single terrorist cell hijacking an airplane in Kuwait or Dubai and crashing it into Abqaiq or Ras Tanura, could turn the complex into an inferno. This could take up to 50% of Saudi oil off the market for at least six months and with it most of the world's spare capacity. Such an attack could be more economically damaging than a dirty nuclear bomb set off in New York City. Since September 11 it has become apparent that there is no shortage of suicide terrorists who are willing to sacrifice their lives for the sake of killing the infidel but recent events in Iraq and Saudi Arabia show that there are those who are also willing to give away their lives for the sake of denying us oil.

What can be done?

- The most effective way to address the scourge of sabotage is to confront terrorists wherever they are. By pursuing jihadists and separatist groups, denying them freedom of operation and destroying their infrastructure, we can reduce the number of attacks.
- International cooperation is also key. I am glad to report that in November, for the first time, NATO will dedicate its Forum, the largest and most important annual gathering to the topic of energy security and critical energy infrastructure protection. This NATO Forum, which is co-sponsored by the Institute for the Analysis of Global Security, will bring together decision-makers at the ministerial level from the alliance and partner countries to assess the problem and examine the potential for the development of new solutions.
- To compensate for the erosion in OPEC's spare capacity, it is critical that major oil consuming countries take steps to insulate their economies from supply disruptions by creating liquidity mechanisms of their own. At its current capacity of 700 million barrels the SPR is sufficient to mitigate supply disruption to the U.S. market but it is not sufficient to tide the global economy over if there is a severe disruption of oil supplies. However, were the

SPR expanded beyond its current capacity, and were Europe and Asia encouraged to establish similarly large oil banks, the SPR could serve as a liquidity mechanism to replace that of OPEC's capacity.

While certainly costly in the short term, expanding each of the U.S., European and Asian strategic reserves to contain 1 billion barrels would have the long-term benefit of keeping the market liquid. An expanded SPR also would signal to the terrorists that the oil weapon can no longer be used against oil-consuming countries.

- Because of oil's role in the war on terror, the U.S. should do its utmost to reduce its dependence on petroleum. A coalition of national security and foreign policy think tanks, environmental and religious groups and labor unions called "Set America Free" (*www.setamericafree.org*) has shown that the U.S. can cut oil imports by half within two decades by deploying available technologies. This $12 billion "Set America Free" blueprint for energy security enumerates ways to increase fuel efficiency and use domestically produced fuels and existing vehicle technologies. By following the blueprint we will not only increase energy independence for America and the free world but we will also minimize the need to transport oil across the globe and thus reduce our vulnerability to an energy Pearl Harbor.

Mr. Chairman,

If we stay on the present course, America will bleed more dollars each year as its enemies gather strength and the world economy will be at the mercy of oil kamikazes determined to go for its jugular. A smart combination of military and energy policies is our best hope for breaking the economic backbone of the jihadists before they do so to us.

Thank you.

Mr. ROYCE. Thank you, Dr. Luft.

Ms. McCollum, would you like to start with any questions?

Ms. MCCOLLUM. Well, we know we are vulnerable and so I have two questions. One is: Why do you think we, as a country—and I don't want to get into party identifying, or whose President when, or whatever—why haven't we, as a country, in your opinion, done what we need, or started to do what we need to do, in terms of conservation, fuel efficiency and investing in renewables?

Norway, which has a huge oil field of its own, went through and did a lot of those things on their own to make not only—to make their oil profits last longer. They were thinking out into the future, and they have oil. I mean, they could consume their own oil very inexpensively.

Secondly, what do you think the international community should do, because we are talking about other sovereign nations where we are receiving our oil from? Should the U.N. be looking at this? Should there be alliances put forward? Should the private sector, which is also very international now in these markets, should they be moving forward? Is there any creative thinking about what to do out there? Because America, as you pointed out, cannot police all these oil pipelines nor do I believe we should. Those are my questions.

Mr. LUFT. As for the first question, why haven't we done the right things, that would be like asking, why haven't we done the right things prior to 9/11? Unfortunately, the American public and its representatives tend to respond to crisis. We may need a crisis to wake us all up and do the right things. Even though people tend to complain about high gas prices, our gas prices are still the lowest in the industrialized world. If you go to Japan or Europe, you see, you buy gas for way over $5 a gallon. So I think that we are not there in terms of public awareness and public understanding of how fragile the system is. But we will get there with the aid of

the likes of bin Laden and others that will show us the light, and then we will respond in kind. I think that this is very unfortunate, but this is where Congress should step up to the plate and make us more secure.

What can be done? I agree that there should be an international cooperation on this issue. It is critical that we, as our spare capacity is declining and spare capacity in the producing world is declining—as my friends explained, we need to create our own spare capacity at the consumer level. Now, we have 700 million barrels in the Strategic Petroleum Reserve. We can insulate our economy. We cannot insulate the Chinese and the Europeans. We ought to have Strategic Petroleum Reserves in other parts of the world as well, and have a mechanism that will allow us to oversee and manage this reserve.

Our institute recommended that we encourage a 3-billion-barrel global reserve, 1 billion in North America, 1 billion in Asia, and 1 billion in Europe, and that will be managed by the International Energy Agency in time of crisis. The catch here is that once you begin to buy oil to put it in reserve, you drive demand. So we will have to pay a price in the short run to make us more secure in the long run, and this is a dilemma that we all have to deal with.

I agree wholeheartedly that a lot should be done in terms of strengthening international cooperation. I am glad to inform you that NATO has taken a leading role in this, and this winter the NATO Forum annual gathering—which is the largest gathering of NATO—will dedicate its forum to the topic of energy security. It will be in November, in the Czech Republic, and we will try to get NATO to play an active role in this issue.

Finally, when it comes to what we can do in the long term, we need to realize that there is a lot that we can do in terms of developing near-term technologies to reduce our demand for oil in the transportation sector. I would like to suggest that Congress take a look at the Set America Free blueprint, which is a blueprint that was put together by a number of national security and foreign policy groups, that suggests ways to reduce our demand for oil in the transportation sector without having to go into the old and tiring debates on CAFE and ANWR and all these things that we never got agreements on. So this is one way we can do it and there is a lot that can be done, particularly after we see the result of the energy bill.

Mr. ROYCE. Mr. Poe, do you have any questions?

Mr. POE. I don't have any questions. Thank you, Mr. Chairman.

Mr. ROYCE. Mr. Dowd, you wanted to respond?

Mr. DOWD. I did. I wanted to respond to Ms. McCollum's question. There are, you know, clearly political reasons why we are in this problem today. You know, we look at the energy bill today and conservation was not in it before. In the 1970s we had similar problems, and we responded by doubling or tripling investment in the oil industry and by essentially doubling the fuel efficiency of the U.S. auto fleet. It took both steps in order to solve the problem and it took a very, very long time. Now, that is a very political issue. I don't want to really delve into that. That is not my area of expertise.

But another reason why we are in this situation today is that the expected supply response has not materialized, and this has caught virtually everybody in the energy industry off guard. If we could grow non-OPEC oil production, 3, 4, 5 percent a year, we would have a spare source of supply. We would have something in reserve in order to meet unforeseen developments.

If we step back to 10 years ago, the expectation had been that the investment in the deep water in the Gulf of Mexico, West Africa, offshore Brazil, North Sea, would lead to an acceleration of non-OPEC production. And the surprise is it hasn't happened. The surprise is, outside of OPEC and the former Soviet Union, reserve replacement has been less than one, 4 years in a row. That is, the amount of oil we find every year versus what we produce has actually been less than outside of those countries.

We have run into this surprise before. We have run into a situation, if we look at U.S. natural gas production since 1996, everybody was expecting a production response. We haven't seen it. We have literally doubled the number of rigs looking for natural gas in the U.S. since 1996, and U.S. natural gas production is down slightly. These are new challenges that really have surprised everybody. I don't think I am overstating that.

Mr. ROYCE. Let's discuss the Cambridge Energy Research Associates study, just to comprehend your views on their analysis, where they are. You are going to get these greater efficiencies, you are going to develop—technology is going to develop ways of extraction. We haven't seen that. They say that was going to increase to a massive 6 to 7 million barrels per day, even with the growth in demand. Have you all taken a look, Mr. Diamond, have you taken a look at this study? And give us your view of the Cambridge study.

Mr. DIAMOND. I haven't read the study word-for-word, but certainly I am aware of its findings. You know, my general take is it is an unknown. I mean clearly there are reasons one could see oil prices drop dramatically and spare capacity increase tremendously in the next years.

We have seen abnormal demand in the United States and China and if that, you know, if that just lessens or goes down just a tad, and we have had higher prices and there has been exploration and supply comes on-line—although we hear of the difficulties that Mr. Dowd has actually said—well, therefore you get a gap now in supply and demand, you get a bigger cushion in supply and demand.

But I think it is one analysis of where the markets could go, but it clearly is not going to happen that way. And I would say it is actually contrary to what other people are saying is going to happen at the moment.

Mr. ROYCE. West Africa has grown considerably; Nigeria, Equatorial Guinea, a number of finds; and certainly the natural gas of West Africa. But that hasn't really appreciably affected the market, it seems.

Mr. DIAMOND. If we look at Africa, I mean why we started the scenario in Nigeria, it really says something; that political instability in an African country, one that there are rumors of al-Qaeda operations there, could drive the markets so tremendously was really telling. The other thing about Nigeria is, you know, we

haven't done anything wrong yet. I mean, we are at a new footing with them. And I know you are looking at how we can secure that.

So I think it is an opportunity for the United States to get it right. The interesting thing is, when we started the simulation, we were worried about going to $58 and starting at that point. Two days beforehand, because of rumors of terrorist attacks in Nigeria, the price just skirted $60. Someone wrote me that even the Nigerians were starting to play along, and it just shows you how easy and how fragile that situation is. So if the U.S. wants to depend on that fragility of this political culture, that is a risk we have to take. But it is a big risk.

Mr. ROYCE. I wanted to ask Mr. Dowd, too, because Chad is up about a half-a-million barrels a day. Equatorial Guinea is about a million barrels a day; Sao Tome, Angola, all are up in that production, and I want to ask you how the markets have adjusted for that.

Mr. DOWD. I am not trying to say that there are no regions in the world that are capable of growing production. It is fair to say that something like 60 percent of the countries that produce oil are seeing their production decline. So it is fair to say that there are success stories. The deep water discoveries to date, if we look globally, account for about 25 percent of the reserve discoveries outside of OPEC and the former Soviet Union. So it is significant. There are challenges. The reserve size, the size of the discoveries offshore Nigeria has been in decline.

Mr. ROYCE. But it is coming at the same time the speculation on the Saudi reserves are less; right?

Mr. DOWD. Well, it is coming at the same time that we are seeing—the production growth that we are seeing in the deep water in the west African region, in the Canadian oil sands, and in certain parts of the world, is actually being offset by production declines in other basins. When you look at, for instance, if we look at why U.S. natural gas production has been flat over the past decade, it is not flat since 1996. It is not flat because production everywhere is flat. It is flat because the growth and production in the deep water and growth and production has not offset the declines in the mature basins in the shallow water Gulf of Mexico, Louisiana, Texas. Those decline rates have actually exceeded the growth we are seeing. So there are successes on the Cambridge Energy Research Study. I hope they are right.

Mr. ROYCE. Mr. Diamond, what was the most interesting debate that went on with the Cabinet members and the former CIA official involved in your scenario there? What surprised you most in their responses?

Mr. DIAMOND. What surprised me most in their responses was the use of the Strategic Petroleum Reserve. It really proved an elusive challenge to these people to decide—I mean, here we have this tremendous group of national security and energy experts, and they could not come to any unanimous conclusion to actually release the reserve. You had a breakdown of the national security folks saying, "Let's not use it; you know, things could get worse. We could need it to go to war."

You had market people saying that we shouldn't use it because when was the price high enough to use it. If we use it, we might

just confirm speculation that things are worse than they are, and the price would just go up and have a contrary effect.

And then ultimately, you know, they got to a point where in the last segment in Saudi Arabia itself—it wasn't terrorist attacks but, rather, terrorism against foreign nationals and international oil expertise, which meant that we didn't take any more oil off the market from Saudi Arabia. Rather, they just could not increase their production from where they were today and actually even deal with some of their natural depletion. And at that point the SPR, the Strategic Petroleum Reserve, in their minds was sort of a useless entity in that this was a much longer-term problem. The prices were so high that it would be just natural demand reduction. And in the end, they just could not come to a unanimous conclusion of when to use it or not. So it is more of an art than a science. And it is not a long-term solution to any of our issues.

Mr. ROYCE. What do participants in the oil market fear most, in your opinion? Is it instability in Saudi Arabia, is it Nigeria, West Africa? I mean, what is the key worry right now? Terrorism, where—or what issue, where?

Mr. LUFT. I think that the thing that is feared most is basically a perfect storm; namely, a combination of unfortunate events that will have a cumulative impact. In other words, you know, we have a number of hurricanes heading toward the Gulf of Mexico in the next several months. Each one of them could hurt our domestic production. If one of these comes, in addition to a geopolitical development or a terror attack, that will have a significant impact on the market.

But I want to emphasize again, we are talking about in most of the scenarios short-term disruptions. These are spikes rather than a plane, and our system is designed to take care of spikes. Just to give you an example, we can, just by making every American inflate his or her tires, fine-tune the engine, and remove the golf clubs from the trunk, we can save between 3 to 5 percent of our gasoline consumption, just by doing very simple things in time of emergency. And I am not even talking about reducing the speed limit or telecommuting or things like this that have much bigger impact.

So I am not discounting the nature of the threat. But I think that we need to remember that we have some very good mechanisms that can be implemented pretty quickly to stabilize the situation. My worry is not what will happen to the American market. I think that the big problem is, what will happen to the developing world, to other consumers? Because in their mind, we import a lot of stuff from other countries. So that will have an impact on—our economy is the best protected economy of all of the other consumers in my view.

Mr. ROYCE. Well, the spikes to $160 a barrel would be a panic, especially in the developing world.

Ms. MCCOLLUM. Mr. Chairman.

Mr. ROYCE. Yes. Ms. McCollum.

Ms. MCCOLLUM. I have a question. I didn't know whether or not to ask it, but then you brought up the developing world. You look at the world over there, and the oil consumers are in the north, and we are the industrialized and developed countries. All the ex-

ploration that people are pretty much looking forward to in the future is in the Southern Hemisphere, the countries that are developing.

What—as we talk about the millennium development goals for Africa, and as Africa moves forward—because that is the goal that I think we all share in becoming more sustainable and more secure—Africa is going to want to start to consume some of its own product, just as Latin America will. Has anybody looked at how that moves forward? Or do we, without realizing it, suppress their development, by our consumption of their natural resource, of what they will be able to do in the future?

Mr. LUFT. Africa. One of the things we need to worry about—and I agree that there is a lot of exploration in the Southern Hemisphere. But there is also a lot of exploration, particularly in Central Asia, very important energy domain for oil and gas. And I think there are two similarities between Africa and Central Asia. We are talking about emerging countries that don't have a good mechanism of democracy and institutions. We want to make sure that in our search for non-OPEC, non-Middle East oil, we don't replicate the problems that we see today in the Middle East. We don't want to replicate the Middle East in Western Africa and Central Asia. We are dealing with tribal societies, very corrupt, very dictatorial. They don't have a good record of handling oil revenues. We need to make sure that in our pursuit of running outside of the Middle East—because the dependency is bothering us from a national security point of view—we don't create a Middle East in Western Africa and in Central Asia, because that will be more of the same. They have a problem in absorbing the revenues. They also have a problem—if you look at Nigeria, in Nigeria you see gas lines today. People are waiting in line to get gasoline. They have so much oil, yet they don't have a good handle of the supply chain, refining capacity. These issues—and bear in mind the second most corrupt country in the world, according to Transparency International, and a third of Nigeria is controlled by Sharia Law, because those who have the oil are not necessarily those who run the country and so on.

There are many, many issues. And add to the fact that it is clear, both by Exxon Corporation as well as PFC Energy Report and others, that the reserves in the non-OPEC world are running out much faster than the reserves in OPEC. So if we increase production in those countries, we need to make sure that we have alternatives down the line, because we are heading toward a situation that once those reserves are being depleted, our dependency on the Middle East, on OPEC, will be stronger than it is today.

Mr. ROYCE. So back to Betty's point, one of the things we looked at in Chad was the architecture of the Chad-Cameroon pipeline arrangement, which brings the World Bank and the IMF and NGOs in to audit the books, the results, and then sets up the accounting for funds which will go for infrastructure, health, education, and then a portion of it is set aside for future needs of society.

By getting that level of transparency in on the accounting, and getting those major actors in the international community and the NGO community involved, we have a hope of moving to a situation where the beneficiaries of the largesse are in fact the citizens of

these countries. I am an enthusiast for this model. My hope is that as we go forward we are able to introduce it as a solution and that we gather the civil society support in other states in Africa. I just wondered about the response from you in terms of that as a template.

Mr. Dowd.

Mr. DOWD. I think it is the ideal template.

Mr. ROYCE. Okay.

Mr. Diamond?

Mr. DIAMOND. I agree that it is critical to bring in the international community and to make sure that the oil revenues are being used properly. In some ways we are both addicted. We are addicted to the resource, and they are addicted as pushers of a drug. It is not good for either of us.

I would say that when looking at EIA projections, though, of Middle East OPEC exports, you know, we are talking about an increase from 23 million barrels in 2005 to 38 million barrels in 2025, a 63 percent increase that we are just depending on the Middle East for.

So, you know, we talk about these other places that we are hoping will produce more oil, but we know that this oil is in the Middle East, and you know, we are hoping we can get it out fast enough. That is another question: How fast can we actually get it out? So there is a demand-supply crunch.

Another interesting point that they brought up in the simulation that they had trouble dealing with was, as Gal said, as Dr. Luft said, in a short-term spike there are few short-term solutions. You can ask the American people to do some of these things, they can last for a year or so, and there are different amounts of draconian nature in some of these things.

There are some good long-term solutions that take 5, 10, 15 years to bring new oil on the line, alternative fuels and everything. But they really had a hard time. How do you ask the American people, you know, at 2—you are at the end of year 1—to wait for 5 or 10 years, to wait for these other solutions if a prolonged crisis happens in Saudi Arabia and we needed to dramatically reduce our demand?

That was really the crunch. The oil experts didn't know how to deal with that, just because of timing—and then national security and political folks.

Mr. LUFT. Mr. Chairman, I want to comment on the model of Chad. You are right in the sense that this model is successful, but it is only successful once you have a cooperation of the leadership of the government.

Unfortunately, what we see in most countries in Africa is that we don't have this kind of commitment and cooperation. My concern is that if we try to impose these kinds of policies that dictate to those governments what to do with their oil revenues and how to handle them, they will find it more and more appealing to do business with countries that don't impose these kinds of restrictions, primarily China.

One of the things we are seeing today in the developing world is that a new type of relationship is going on between developing countries and China. The Chinese don't impose any limitations on

distribution of wealth or human rights or any of this stuff that we are talking about. What they do, in exchange, is they provide the developing money. They come with cash, they build ports, railways, telecommunications system, et cetera.

Mr. ROYCE. And they provide a veto at the Security Council. So if we go to Darfur and raise the issue, they are in the Security Council to say, "No, we will protect the National Islamic Front Government against international opinion."

Or if we raise an issue about human rights, you know, in Harare, Zimbabwe, they say, "No, we will protect you in terms of security if you do the arrangement and if you disband your courts in the rule of law, because we don't want to see that kind of institution. We are offering a different model."

Mr. LUFT. Look at Uzbekistan, $600 million got them the solid support of Islam Karimov, and we are being kicked out of the region.

Mr. ROYCE. Very interesting. This Subcommittee has looked at many of the different terrorist threats facing this country, including the threats of terrorists getting their hands on WMD, and you have presented a case here that this is one of the foremost threats facing the country, as panelists.

So the question, I think, for us is: What should the priorities be, where should our focus be? Because we can't do everything. So let us just have a quick response in terms of your answers to that.

Mr. DOWD. I think the focus should be what you control. We can hope for an acceleration in oil production, but here in the U.S., from a political point of view, we can't control it. We can—it will be difficult—it will be difficult to protect facilities globally. Should we try? Yes, but that really is not under our control. What we control is what we consume here. I think the focus has to be on the CAFE standards.

Mr. ROYCE. Mr. Diamond.

Mr. DIAMOND. There are three solutions to this, which is an increasing supply, decreasing demand dramatically and finding alternatives. And I think it is important to say that increasing supply is a critical component because, you know, it is such a tight market and any extra supply can help. If that is the only solution, that this country thinks we can drill our way out of this problem, we are in for a shock.

Mr. ROYCE. A shock.

Mr. DIAMOND. So as Mr. Dowd said, control. What we can control is our demand and finding alternatives, the point that it just takes time to change fleets of cars and things. So we have to be—you know, that is the focus, which is 97 percent of our cars run on gas and 68 percent of our oil use is for transportation.

So I think that has got to be a national security priority for this country.

You know, the other things are important, too. But it is so easy to drive the economy of the world, the global economy and the U.S. economy for these terrorists. So we need to deal with our demand issues.

Mr. ROYCE. Dr. Luft.

Mr. LUFT. I agree with all of this, but the single most important thing that needs to be done to insulate our economy in the short

run is to understand that there will—for as long as human beings need and use oil, there will not be any more spare capacity in the hands of the producers. Anybody who thinks differently just doesn't understand the oil market. Spare capacity is a product of the 1973 oil embargo and its aftermath when the Saudis had a lot of money to invest in equipment that sits idle most of the time, and every now and then they use it.

In today's oil market, this is not going to happen. No country will invest billions of dollars in producing spare capacity. So we need to assume that spare capacity is history in the hands of the consumers. We need to invest in producing spare capacity in the hands of the consumers. That is through developing a more robust internationally managed Strategic Petroleum Reserve, and we recommend a 3-billion-barrel global reserve.

We need to also realize that we have a responsibility toward other countries that don't have this, particularly our neighbors in the Western Hemisphere. We have responsibility for their future, because we don't want every country to begin to—so, you know, we have 700 million today, which we can use for our own market. But the reason we need more is because we need to be able to export oil in time of emergency to those countries that don't have those reserves at hand.

Mr. ROYCE. Dr. Luft, are you assured, have you assured yourself that what we pour into the ground as part of this reserve that we get 100 percent of that back? I have always wondered about the porousness of that. I have always wondered about that strategy, and if there isn't quite a bit of lost oil, crude, as a result of that.

Mr. LUFT. The domes are that—not only is there no known leakage or loss, in fact, the domes are being deepened naturally. So all of a sudden we got 27-million-barrel capacity that was added because of the decline of the dome. So that was unexpected. But the amount of oil that can be stored can also be increased. I am not even talking about underground storage. It can also be aboveground storage.

Mr. ROYCE. Yes, above ground. But let me ask Mr. Diamond for his opinion on that.

Mr. DIAMOND. I have a bit of a different opinion. I would say, as we were putting together the simulation, of course, we have to keep asking our questions about the SPR, and most of the people shrugged and said, I am not sure it will actually work.

You know we are talking about you can only get 4 million a day out of it. That is the rate of flow. We have never done more than 1 million barrels. We have never done it for a very long time. I would say there is a lot of debate.

Mr. ROYCE. I was wondering how you would actually ascertain for sure that it doesn't seem, you know——

Mr. DIAMOND. The oil is there. They are not sure they can get it out the same way. Also there were issues on the West Coast, meaning if you took it out of the SPR one of the problems we had is because Alaska oil is so important in California there may be extra shortage in California and the SPR wouldn't necessarily be helpful to that area.

And with the SPR, there are only two publicly held reserves in Germany and Japan. The rest is held by private companies, includ-

ing in the United States. There are apparently billions and billions of barrels held by private companies.

The other opinion we received by many people is because of just-in-time inventories in the oil business today, that is nothing too much to rely on either.

So, you know, there was a lot of debate saying we let the SPR work during the simulation because we didn't want to get into that argument. But even if you assumed it would work, it was very difficult to figure out when to use.

Mr. ROYCE. I want to go to another question. Pipelines, facilities, refineries, is it worth making this a priority, the protection of those assets?

Mr. LUFT. Mr. Chairman, it is very difficult to protect a pipeline. We are talking about a country like Iraq. We have 4,000 miles of pipeline. We have 14,000 people protecting those pipelines. We have the patrol, United States military, Iraqis, and we cannot prevent those attacks.

There is a lot of technology that can help us monitor it, but they cost money—if we invest in those technologies, surveillance systems, we are going to pay more for the oil.

In Saudi Arabia, of 10,000 miles of pipeline, they cannot put a soldier in every yard of the pipeline. So it is important to realize that we will not be able to prevent it all together. But what I suggest that we do is we make sure that when there is an attack we can restore production very fast. We need to have enough spare parts, enough teams on the ground that can repair it so that instead of it taking weeks, it takes a couple of days.

Mr. ROYCE. What has the trend line been? Are these attacks on the energy infrastructure worldwide? Are they increasing? Are they flat? Are they decreasing? That is a key question.

Mr. LUFT. They are definitely increasing.

Mr. ROYCE. Definitely increasing. Okay.

Yes, Mr. Dowd.

Mr. DOWD. On the refining side, one potential solution would be to encourage much more refining capacity to be built, refining capacity. An increase in refining capacity could increase the yield of gasoline.

Mr. ROYCE. Make that a national security argument so that we can trump. I mean, that is a very difficult thing to do in terms of the NIMBY syndrome.

Ms. MCCOLLUM. I have one in my district.

Mr. ROYCE. Yes. Please don't try to close it down.

Mr. LUFT. If I might add——

Mr. ROYCE. I have been trying to help on the Liquefied Natural Gas plan on Long Beach. I can tell you, it is a tough climb.

Mr. LUFT. Just one thing to add, when we monitor the attacks and we look at the trends, we only look at politically-motivated attacks. We have to remember that, particularly in the developing world, there is a lot of looting going on.

Mr. ROYCE. Right.

Mr. LUFT. People just puncture a pipeline to get the oil, and will sell it on the black market. This is not politically motivated, but it also adds a lot of pressure and a lot of loss.

Mr. ROYCE. I have seen it in Nigeria, yes, firsthand.

Mr. DOWD. I was hoping to answer a question you asked earlier if you don't mind. You asked: What do we think is the primary concern of the executives in the oil industry? I think that—well, I know that the executives I talked to are primarily focused on their own companies and achieving their business plans.

As a result, they are concerned with access to oil service equipment. They are concerned with costs. It should be known that the cost of making oil, the cost of finding oil, are moving up very, very rapidly.

For instance, when we look at the return of capital on the public EMP companies in the U.S., it is actually flat between 2001 and 2005, which is actually a stunning statement. Oil prices have almost doubled, but the returns that people are making in exploration and development have actually stayed flat.

Mr. ROYCE. Yes. In deep-water drilling we get excited about the potential. We forget about the potential costs.

Mr. DOWD. That is right. But the point being that this cost escalation that we are seeing in the industry doesn't look cyclical. Between 1992 and 2002, according to the American Petroleum Institute, the average cost of a well in the U.S. increased at a rate of 9 percent per year. Reserves added per well in the U.S. didn't go up.

We are seeing structural inflation that is really very geologically driven in the high-cost area. While this cost inflation isn't true in all parts of the world, the U.S. is still the second largest producer of hydrocarbons in the world. And as a result, the economics here do count.

Mr. ROYCE. I had two last questions for Dr. Luft. You mentioned the NATO forum, I think, in November. That is going to be dedicated to energy security. What country is taking the lead on setting that agenda and what is hoped to be accomplished in that?

Mr. LUFT. The agenda is being set by the Economic Directorate of NATO and the Science and Technology Branch of NATO. NATO members and alliance members will send a Cabinet-level representative to deal with this problem and see what can be done within the framework of NATO. NATO has already indicated that there will be a follow-up forum in 2006 in Washington, DC.

Mr. ROYCE. So the Department of Defense obviously would be involved?

Mr. LUFT. And the Department of Energy as well.

Mr. ROYCE. And Energy.

The last question, a lot of people are saying that al-Qaeda is moving away from an organization and it has become a movement, basically, and if that theory is correct, what does that mean for the threat in the energy sector?

Does that make it more likely, the same, less likely, the morphing of al-Qaeda as a phenomenon? A lot of the leadership has been removed, two-thirds since 2000. A lot of their lieutenants are dead or in custody. But the methodology of the organizational structure has changed in terms of the way the nodes operate and the way we see this thing morphing. I want to ask you about that.

Mr. LUFT. If it is true, that means that it will be more difficult for them to orchestrate spectacular attacks along the supply lines,

the kinds of things that people talk about, you know, blowing up simultaneous—simultaneous attacks in various choke points.

But, on the other hand, I think it will be safe to assume that there will be more and more sporadic attacks around the world, particularly in those countries where there is a significant infrastructure and security is lax. I think that we are heading toward a period in which we will see more of the same. We need to assume that there will be considerable bleeding from the system.

However, the big, big puzzle here is: What will happen with Iraq? Because if we are able to bring Iraq back and sort of stop it in Iraq, Iraq alone, I estimate that we are losing about 1 million barrels a day just as a result of sabotage.

Mr. ROYCE. Do you think a lot of that is foreign fighters?

Mr. LUFT. I think most of it is foreign fighters, yes.

Mr. ROYCE. I see.

Mr. LUFT. If we are able to stop this, 1 million barrels a day would bring oil prices today from the 60s back to the 40s. That shows you this is something very significant. We need to succeed in Iraq, and we can stop the sabotage there by getting the Iraqis to fight against this.

They need to understand that it is something that hurts them more than anybody else. If we are able to do this, then we can begin to see an increase in production because Iraq can offer us a lot of oil in the future.

Mr. ROYCE. Thank you. Gentlemen, I thank you all for coming down and testifying today. We appreciate it very much.

We stand adjourned.

[Whereupon, at 4 o'clock p.m., the Subcommittee was adjourned.]

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